CITY OF SCOTTSDALE

Abbreviated Water and Sewer Needs

PRELIMINARY WATER & SEWER PLAN
SWC N SCOTTSDALE ROAD & CONTINENTAL DRIVE
1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

SUBDIVISION PLAT LOCATED WITHIN A PORTION OF THE E 1/2 OF THE SE 1/4 OF THE NE 1/4 OF SECTION 11, T.3N, R.4E OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- MONUMENT LINE
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- SEWER CLEANOUT
- LIGHT POLE
- SEWER MANHOLE
- STORM DRAIN INLET
- TRANSFORMER
- TELE COMMUNICATIONS PEDESTAL
- CATV, PHONE
- GAS LINE
- CATV, PHONE
- SEWER LINE
- WATER LINE
- ELECTRIC LINE
- FIRE LINE

NOTES

1. ANY PROPOSED SOIL NAILING FOR THE PARKING GARAGE SHALL FOLLOW THE REQUIREMENTS OF SECTION 1-3.600 OF THE DSPM.
2. TRASH COMPACTOR CAPACITY CONVERSION EQUATING TO THE CITY'S REQUIRED ONE ENCLOSURE FOR EVERY 20 UNITS WITH NO RECYCLING OR 2 ENCLOSURES FOR EVERY 30 UNITS WITH RECYCLING.
3. THE PROPOSED COMPACTOR WILL REQUIRE A GREASE, OIL AND SAND SEPARATOR.

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN IS SITUATED (IN) SCOTTSDALE, IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS:

LOT 1, A PROPERTY ASSEMBLAGE IN THE CITY OF SCOTTSDALE, ACCORDING TO BOOK 815 OF MAPS, PAGE 7, RECORDS OF MARICOPA COUNTY, ARIZONA LOCATED IN THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 3, TOWNSHIP 1 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

APN: 129-13-002G, 129-13-002K, 129-13-003D, 129-13-002J, 129-13-004D, 129-13-004E

FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY # 045012	PANEL # 2235 OF 4425	SUFFIX L	BASE FLOOD ELEVATION N/A
MAP # 04013C	PANEL DATE 10/16/2013	ZONE X*	

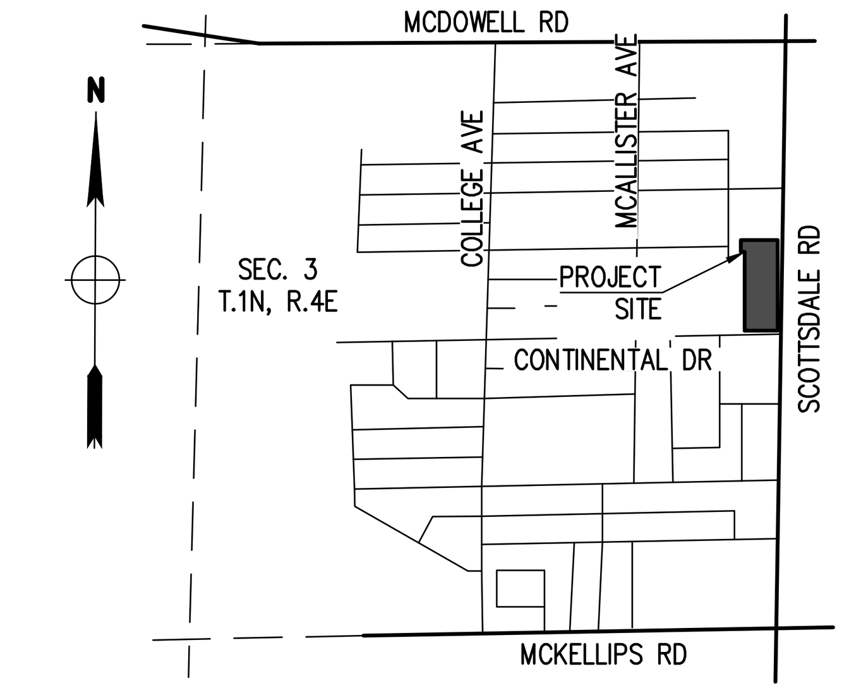
*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

BASIS OF BEARINGS

THE MONUMENT LINE OF SCOTTSDALE ROAD THE BEARING OF WHICH IS N00°00'00"W, AS SHOWN ON THE PLAT OF MARK MITSUBISHI, RECORDED IN BOOK 815, PAGE 7, MCR.

BENCHMARK

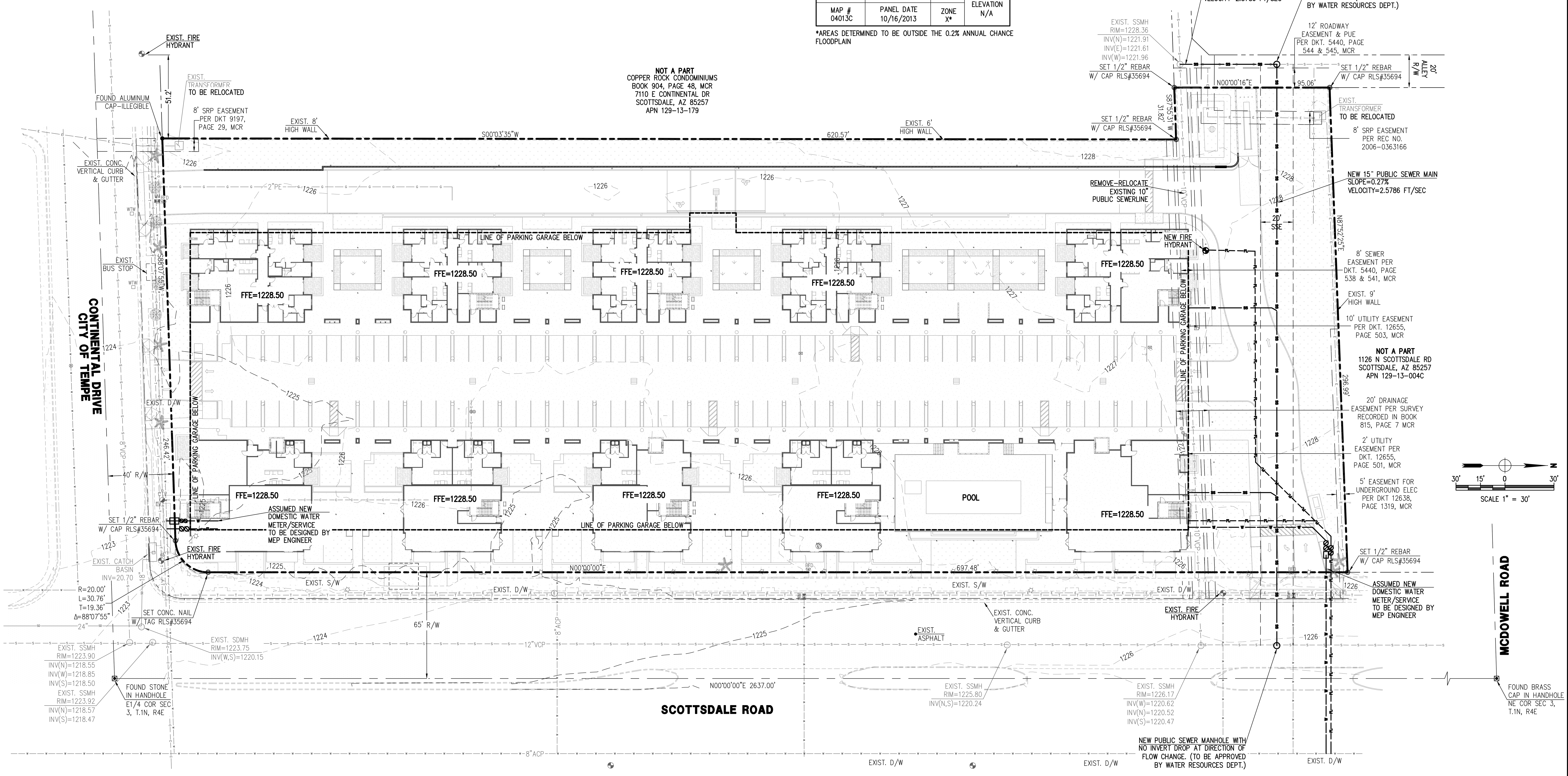
BRASS CAP IN HAND HOLE AT THE INTERSECTION OF SCOTTSDALE RD AND MCDOWELL ROAD HAVING AN ELEVATION OF 1230.69, CITY OF SCOTTSDALE DATUM, NAVD 88 DATUM, BM# 5032



VICINITY MAP
NTS

SITE DATA

APN: 129-13-002G, 129-13-003E, 129-13-003D, 129-13-004D
ADDRESS: 1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257
LOT AREA: 192,943 S.F (4.429 AC.)
Q.S.: 12-44



PRELIMINARY WATER & SEWER PLAN

1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

DATE: 08/19/19 | JOB: 1711151 | VERSION: 1.1 | PLOT DATE: 08/19/19

SCALE: 1"=30' | DESIGNED BY: NP | DRAWN BY: DW | CHECKED BY: JI

REVISIONS:

land DEVELOPMENT GROUP
P 602 889 1984 | F 602 445 9482
8808 N CENTRAL AVE., SUITE 288
PHOENIX, AZ 85020

PRELIMINARY NOT FOR CONSTRUCTION

PWS
1 OF 1

14-ZN-2018
8/29/2019

PRELIMINARY Basis of Design Report

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☑ REVISE AND RESUBMIT

CITY OF SCOTTSDALE

SCOTTSDALE WATER

9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY ldillon DATE 7/13/2020

Land DEVELOPMENT GROUP

PRELIMINARY WATER AND SEWER REPORT

Address comments below and herein and resubmit:

1) Capacity available offsite on Scottsdale Rd 12-inch sewer has to be analyzed. Contact Water Resources 480-312-5319
2) Calculations errors on wastewater flows
3) Provide details on how sewer flows split (gpm for each building sewer/discharge point).
4) Detail where pool backwash will discharge.
5) Analyze capacity impacts on Continental Drive and verify acceptable conditions.
6) Hydrant flow test expired (from 2018), redo.
7)The proposed 15□ sewer needs to extend from the manhole just to the west of the property out to Scottsdale Road. The City does not want a small section of 10" sewer that could become a bottleneck in the future. Was also 2018 comment. Note this may be able to be a smaller size sewer. Capacity analysis and discussion needed with Water resources.
8) Meter size needs to be determined and shown on utility plan. 3" and larger meters require vaults. Meters/vaults need to be shown within city easement. No meter vault called out. Was also 2018 comment. DS&PM 6-1.416
9) Show a 20ft sewer line easement on the relocated public sewer line. No dimension called out, portion of sewer line outside easement. Was also 218 comment.

REVISED AS REQUESTED

ALTA CONTINENTAL

NWC of Scottsdale Road & Continental Drive

1000 N Scottsdale Road
Scottsdale, AZ 85257

CASE NO. 14-ZN-2018

Prepared for:
Five Star Development / Wood Partners

Submitted to:
City of Scottsdale
Planning & Development Department
7447 E. Indian School Rd, Suite 105
Scottsdale, AZ 85251

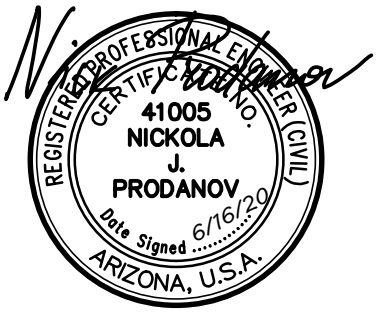
Prepared by:
Land Development Group, LLC
8808 N. Central Avenue, Suite 288
Phoenix, Arizona 85020
Contact: Nick Prodanov, PE, PMP
P: 602 889 1984

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41005 NICKOLA J. PRODANOV Date Signed 6/16/20 ARIZONA, U.S.A.

June 16th, 2020

TABLE OF CONTENTS

APPENDICES



June 16th, 2020

1. INTRODUCTION

This preliminary water report and related water and sewer plan have been developed in accordance with the current Arizona, Maricopa County and City of Scottsdale ordinances, standards and policies for design and operation of domestic and fire water facilities. It provides engineering analysis and assessment of the existing and proposed water systems that currently service and will be installed for the subject development, located at 1000 N Scottsdale Road, Scottsdale, AZ 85257, and also being a portion of the NE ¼ of Section 11, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to Appendix A-1 – Vicinity Map.

The parcel is located within the Scottsdale Q.S. 12-44. The project site consists of a fully developed parcels, with a total area of 4.429 acres, located at the northwest corner of Scottsdale Road and Continental Drive – 1000 N Scottsdale Road, Scottsdale, AZ 85257. The property historically housed car dealerships. It is zoned C-3 and it is bounded by Continental Drive on the south, Scottsdale Road on the east, a commercial development on the north, and multifamily residential development on the west.

The proposed mixed-use development consists of 4-story building with roughly 280 multi-family residential units and roughly 10,000 s.f. of commercial space, parking garage and driveways. Vehicular circulation is provided by two driveway entrances on the northeast and southwest sides of the site and a 24’ wide drive that is continuous around the building from the north and west sides. Surface parking is provided in the parking garage.

This report provides results for the water service demands for Average Day, Maximum Day, Peak Hour and Fire Flow rates for the entire development. No phasing is anticipated for this project. The results provided herein demonstrate that the proposed water system is capable of providing for the estimated demand and is in compliance with the City standards and performance. No wells or on-site water storage are proposed with this development. The procedures used herein are derived from, and performed with, currently accepted engineering methodologies and practices.

2. EXISTING CONDITIONS

Currently the site is fully developed with asphalt pavement and a single-story commercial building. The entire property will be demolished and cleared with the proposed project. The lot consists primarily of impervious surfaces with small DG landscape area along the frontage of Scottsdale Road. The overall existing terrain on site is flat with overall grade change from north to south at about 3’. The land in the vicinity generally slopes in southerly direction. The site has an average elevation of 1226 (NAVD88), a peak elevation of 1228 and the lowest elevation of 1224.

City of Scottsdale is the water and sanitary provider for this project. Based on the obtained by the City Water and Sewer Maps, 12" VCP public sewer main runs in Scottsdale Road, and 8” VCP sewer main in Continental Drive. There is also a 10” VCP main that runs in an 8’ sewer easement, west to east, in the north portion of the site. Most likely existing buildings are served off the latter 10” VCP

sewer. The project is located within Pressure Zone #1 with Ground Elevation Ranges of 1250 to 1330.

There is an 8" ACP water main in Scottsdale Road, and two unknown size mains in the Continental Drive right of way. The water main that runs north of the sidewalk in Continental is a dead-end line that serves the multifamily development to the west of the subject project. Two test wells were noted on this line. Three water meters supply domestic and landscape irrigation water to the existing site. There is an 8" ACP line connected to the 8" main in Scottsdale Road that is used for fire sprinklers system. There are two fire hydrants in the street – NWC of Scottsdale Road and Continental Drive and another one near the northeast corner of the site.

3. DESIGN CRITERIA AND PROJECTED WATER DEMANDS

The following design parameters and requirements were derived from the City of Scottsdale Standards and Policies manual, Figure 6.1-2:
Average day demand per dwelling unit: **185.3 gpd (0.27 gpm per unit)**

Average Day Demand for retail/amenity: 0.8 / s.f. or **9,634** gpd (0.00111 gpm per s.f or **13.37 gpm**)

Maximum daily peaking factor: **2.0**
Peak hour demand factor: **3.5**

City of Scottsdale Fire Department follows 2018 International Fire Code.
Per the Appendix B, Section B105.2 of 2018 IFC, up to a 75% reduction of the fire flow can be granted if an approved automatic sprinkler system is installed. The resulting fire flow shall not be less than the required minimum of 1,500 gpm.

Proposed construction type is V-A with the following breakdown of the square footages per building use:

- Retail: 10,000
- Rentable/Residential: 262,857 SF
- Garage: 19,603 SF
- Surface Parking: 493 SF

MINIMUM REQUIRED FIREFLOW AND FLOW DURATION FOR BUILDINGS

BLDG DESIGNATION	CONSTRUCTION TYPE	GROSS AREA (s.f.)	FIRE FLOW (gpm)	FLOW DURATION (hrs)
Garage	V-A	19,603	2,500 (1,500)*	2
Residential Building	V-A	262,857	8,000 (2,500)*	4

*Max from 75% Reduction Applied for Fully Sprinklered Building and 2,500 gpm

The static pressure in the distribution system should not exceed 120 pounds per square inch (psi), and the system shall be designed to maintain a minimum residual pressure of 50 psi at the highest, finished, floor level to be served by system pressure under normal daily operating conditions. The system is designed to maintain 30 psi minimum pressure under the design fire flow requirements. The 30 psi minimum pressure requirement provides a 10 psi safety factor to account for aging infrastructure and flexibility in locating pressure zone boundaries.

4. PROPOSED WATER PLAN AND HYDRAULIC MODEL

New public 8" water main is proposed to loop around the proposed development. It is connected to the existing 8" ACP in the Scottsdale Road are proposed in the driveways. Fire sprinkler taps are connected to the new 8” water line. In addition, two new fire hydrants are proposed at the back side of the property to provide for minimum fire hydrant coverage. FDCs will be installed on the north and south sides of the buildings. A fire lane will be provided on the north and west sides.

The project will be served by two water meters. Existing 1" water meter is proposed to serve the landscape needs. Sizes of the water meters will be verified by the plumbing engineer during the design process. All existing services to the water mains in the streets. Per the COS Design Standards & Policies Manual, the recommended max. capacity of 2" water meter is 80 gpm.

The demand used for the required fire flow is 2,500 gpm, which is the maximum of the 2,500 gpm required and the 75% reduction of the required 8,000 gpm due to the fact that the buildings will be fully sprinklered as per the 2018 IFC, Appendix B, Section B105.2. Water systems were analyzed for peak hour and maximum day with fire demand.

A fire flow test was conducted for the site on May 22nd, 2018 by Arizona Flow Testing. The flow test resulted in 2,757 gpm of available water at 20 psi and a residual pressure of 22 psi when 18 psi safety factor is considered.

The overall fire flow is provided by two new fire hydrants connected at the proposed 8” main and two existing fire hydrants in the City right of way. The minimum pressure of 30 psi shall be

exceeded while modeling the system with the total required fire flow demand. The velocities in the water main shall be maintained below the maximum of 10 ft/sec for the required fire flow demand.

Refer to Appendix A-5 for fire flow test results and Appendix A-6 for water calculations.

SEE REVISED REPORT

5. SANITARY SEWER SYSTEM

analyze capacity

Existing 10" public sewer line is in conflict with the proposed development and will have to be removed or abandoned. New 15" public sewer main is proposed to be connected into the existing 12" VCP public sewer under Scottsdale Road. The proposed sewer line is located along the north property line under the new driveway. Minimum slope of 0.20% will be used for the line. Three new pubic sewer manhole with no invert drop are suggested with the development of the sewer line, which will be subject to approval by the Water Resources Department.

The maximum d/D of an 12-inch sewer main at ultimate peak flow per the City of Scottsdale Design Standards and Policies Manual is 0.65. This equates to a maximum allowable discharge of 987 gpm (2.2 cfs) at a velocity of 2.6 fps at slope of 0.2%. We have calculated that the peak discharge from this development will be 257 gpm. In our opinion the portion of public sewer line that this site discharges to has an adequate capacity.

need analysis

We have also estimated the sewer discharge from the site using The City of Scottsdale Design Standards & Polices Manual. The average daily flow was estimated at 0.0944 cfs. The peak discharge was calculated by increasing the average daily flow by a factor of 4.5, which is a total of 0.42 cfs. Using Manning's Equation, we calculated that the proposed 15-inch sewer line at a minimum of 0.2% have a velocity of 2.45 fps flowing full with a capacity of 2.89 cfs. Pool backwash is not planned for this development as filter cartridge system is planned for the pool. If Pool backwash is desired, it shall be connected to the sanitary sewer system and not discharge to the storm drain system. For the purpose of the design we have assumed a pool backwash flow rate of 100 gpm (0.22 cfs). Actual backwash discharge rate shall not exceed 100 gpm. Backwash pump and pipe sizing will be done by the pool designer under separate permit. Refer to Sanitary Sewer System Design Calculations in Appendix A-7.

6. CONCLUSIONS AND RECOMMENDATIONS

The proposed development and associated new water system comply with the City design standards and policies and the Scottsdale Integrated Water Master Report. It is anticipated that the construction would start in first quarter of 2020 and will continue for 24 months.

Specified water lines are 8 inch in diameter and shall be ductile iron pipe (DIP) with a minimum pressure class of 350. All ductile iron water lines shall be installed with polyethylene wrapping. Existing tees, tapping sleeves and related appurtenances that are not utilized by the development shall be removed by the contractor. A minimum of 3-foot section of pipe shall be removed and replaced, with no more than 6-feet remaining to the nearest joint.

yes, good

Fittings cut into the existing 8" ACP main within 6-feet of another fitting or joint will require the short section of pipe to be removed and replaced with DIP. No water line will be deflected either vertically or horizontally, in excess of the recommended (but not exceeding 4 degrees) by the manufacturer of the pipe or coupling, without the appropriate use of bends or offsets. Fittings may be required where more than 2 pipe lengths are deflected.

Shutoff valves will be installed on water mains at locations within the distribution system that allow sections of the system to be taken out of service for repairs or maintenance. A sufficient number of

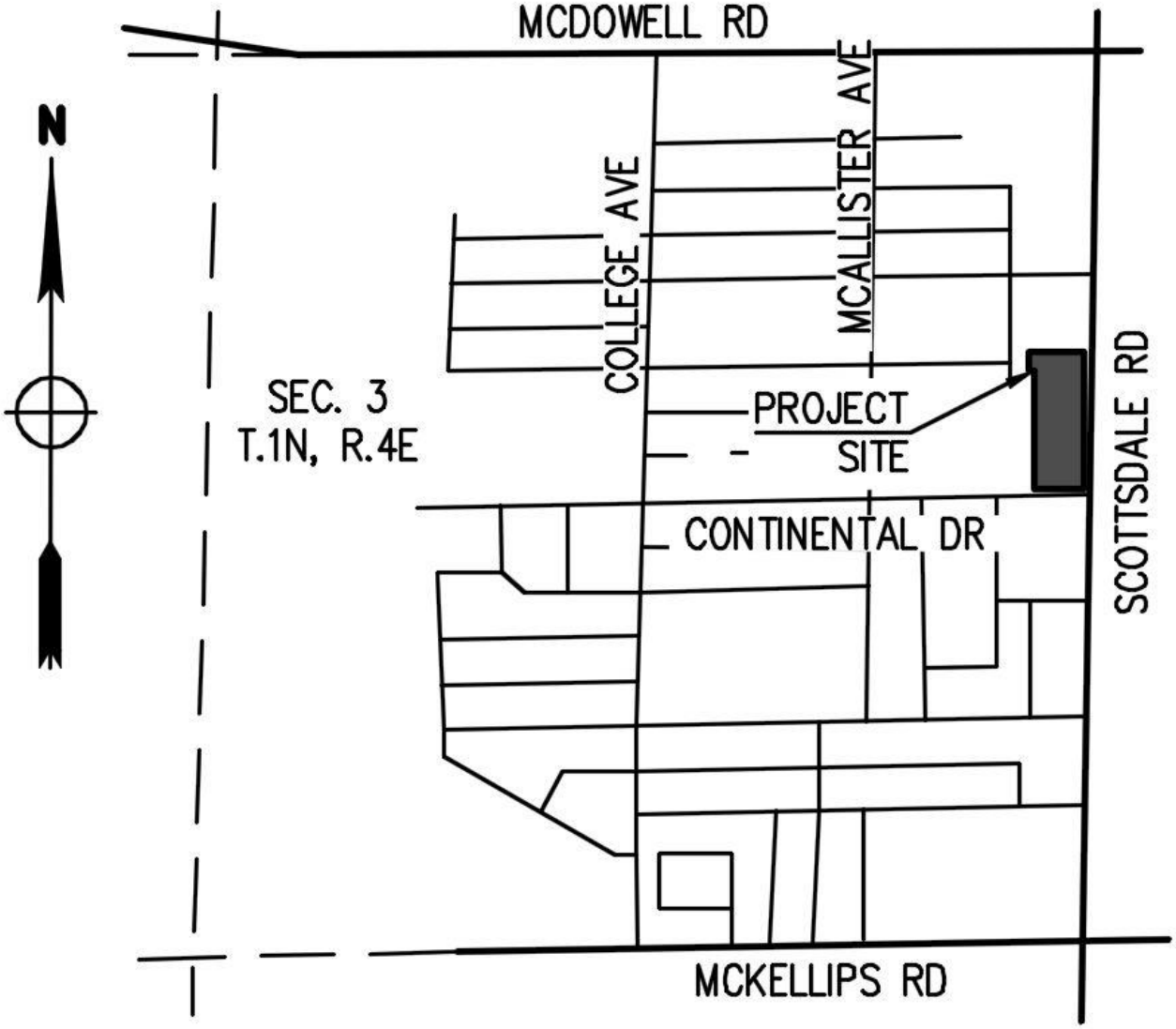
valves are provided on the proposed water lines so that inconvenience and sanitary hazards will be minimized during repairs. Maximum spacing of water distribution main isolation valves does not exceed 500 foot.

All water mains shall maintain 3 feet horizontal clearance to dry utilities. Water and sewer mains are placed under the paved section of the driveways. Vertical separation of water and sanitary sewer lines shall be in compliance with the COS Standard Detail No. 2401. For minimum clearance under culverts, storm drains, and other utilities, contractor shall refer to COS Standard Detail No. 2370 and 2372. The vertical realignment of the water mains shall be constructed of ductile iron pipe and shall not be deflected or swept. All metered services will require the installation of an approved backflow prevention device immediately adjacent to the meter on private property unless approved otherwise by the Water Resources Department.

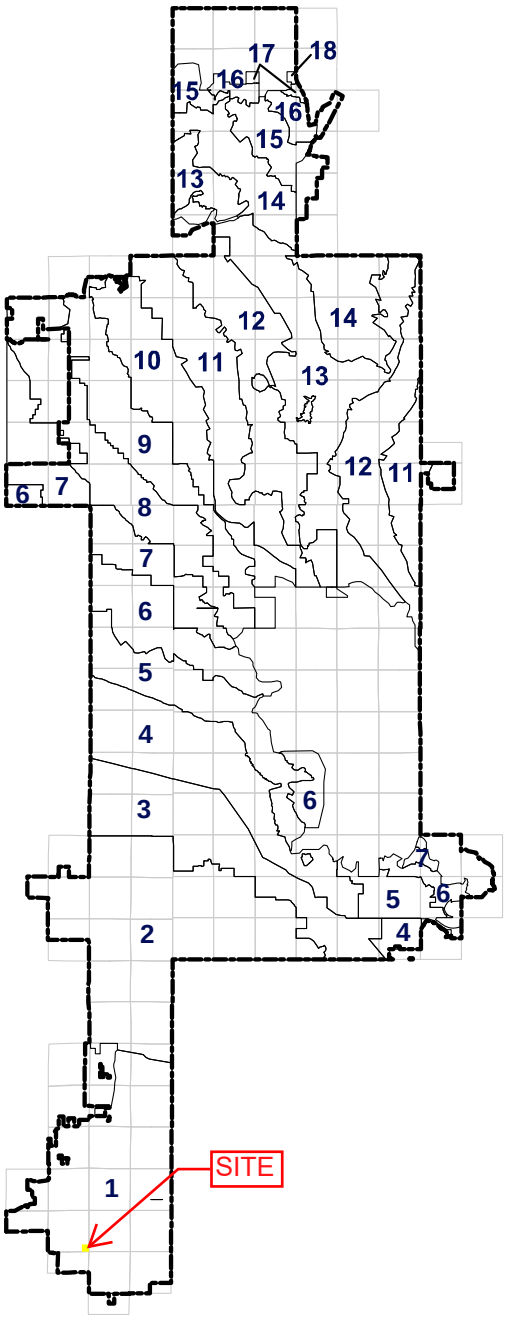
7. REFERENCES

- City of Scottsdale Design Standards & Policies Manual
- City of Scottsdale Pressure Zone Map
- City of Scottsdale Quarter Section Maps
- ADEQ Engineering Bulletin No. 10, “Guidelines for the Construction of Water Systems”

APPENDIX A-1
Vicinity Map



APPENDIX A-2
Pressure Zone Map



Zone	Ground Elevation Range (Ft.)	
1	1180-1280	1226
1A	1250-1330	
2A	1280-1330	
2	1330-1440	
3	1440-1550	
4	1510-1650	
4E	1550-1650	
5	1650-1790	
5E	1650-1750	
6	1790-1920	
6E	1750-1934	
7	1920-2050	
7E	1934-2065	
8	2050-2180	
8E	2065-2200	
9	2180-2310	
10	2310-2440	
11,11E	2440-2570	
12,12E	2570-2700	
13	2700-2830	
14	2830-2960	
15	2960-3090	

FIGURE 6.1-3 PRESSURE ZONE MAP

6-1.300 WATER FACILITIES

Water facilities (wells, reservoirs and booster pump stations) are typically designed and constructed by the city through its capital improvement program. Developers needing to construct water facilities should contact the Water Resources Department and request a meeting. The developer should be prepared to address how the proposed system will conform to the Integrated Water Master Plan. The city will address design issues, the review process for facilities and any potential city cost participation.

APPENDIX A-3
Public Water and Sewer Maps

13-44

12-43

12-45

11-44

12-NOV-17

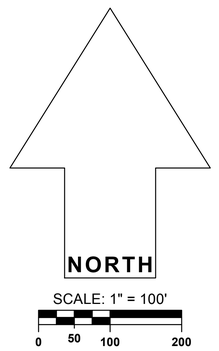
GENERAL NOTES:

- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS 'CALCULATED' ON THE MAP.

LEGEND:

- Water Valve
- Non-potable Water Valve
- Fire Hydrant
- Water Blowoff
- Water Main Reducer
- Water Sample Station
- Water Air Release Valve
- Non-potable Water Air Release Valve
- Water Pressure Reducing Valve
- Water Vault
- Water Manhole
- Non-Potable Water Manhole
- Water Pump
- Water Main
- Non-Potable Water Main
- Fire Line
- Water Service
- Non-Scottsdale Water Main
- Sewer Manhole
- Sewer Cleanout
- Sewer Lift Station
- Sewer Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Non-Scottsdale Sewer Main
- Sewer Service

VICINITY MAP



WATER & SEWER

QUARTER SECTION MAP

12-44

NE 1/4 SEC. 3 T1N R4E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

14-ZN-2018
9/1/2020

APPENDIX A-4
Preliminary Water and Sewer Plan

PRELIMINARY WATER & SEWER PLAN
ALTA CONTINENTAL
1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

SUBDIVISION PLAT LOCATED WITHIN A PORTION OF THE E 1/2 OF THE SE 1/4 OF THE NE 1/4 OF SECTION 11, T.3N, R.4E OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- MONUMENT LINE
- WM — WATER METER
- WATER VALVE
- FIRE HYDRANT
- SEWER CLEANOUT
- LIGHT POLE
- SEWER MANHOLE
- STORM DRAIN INLET
- T — TRANSFORMER
- TV — TELE COMMUNICATIONS PEDESTAL
- C — CATV, PHONE
- G — GAS LINE
- T — CATV, PHONE
- S — SEWER LINE
- W — WATER LINE
- E — ELECTRIC LINE
- FL — FIRE LINE

SITE DATA

APN: 129-13-002G, 129-13-003E, 129-13-003D, 129-13-004D
ADDRESS: 1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257
LOT AREA: 192,943 S.F (4.429 AC.)
Q.S.: 12-44

FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY # 045012	PANEL # 2235 OF 4425	SUFFIX L	BASE FLOOD ELEVATION N/A
MAP # 04013C	PANEL DATE 10/16/2015	ZONE X*	

*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN IS SITUATED (IN) SCOTTSDALE, IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS:

LOT 1, A PROPERTY ASSEMBLAGE IN THE CITY OF SCOTTSDALE, ACCORDING TO BOOK 815 OF MAPS, PAGE 7, RECORDS OF MARICOPA COUNTY, ARIZONA LOCATED IN THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 3, TOWNSHIP 1 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

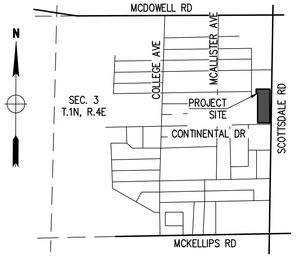
APN: 129-13-002G, 129-13-002K, 129-13-003D, 129-13-002J, 129-13-004D, 129-13-004E

BASIS OF BEARINGS

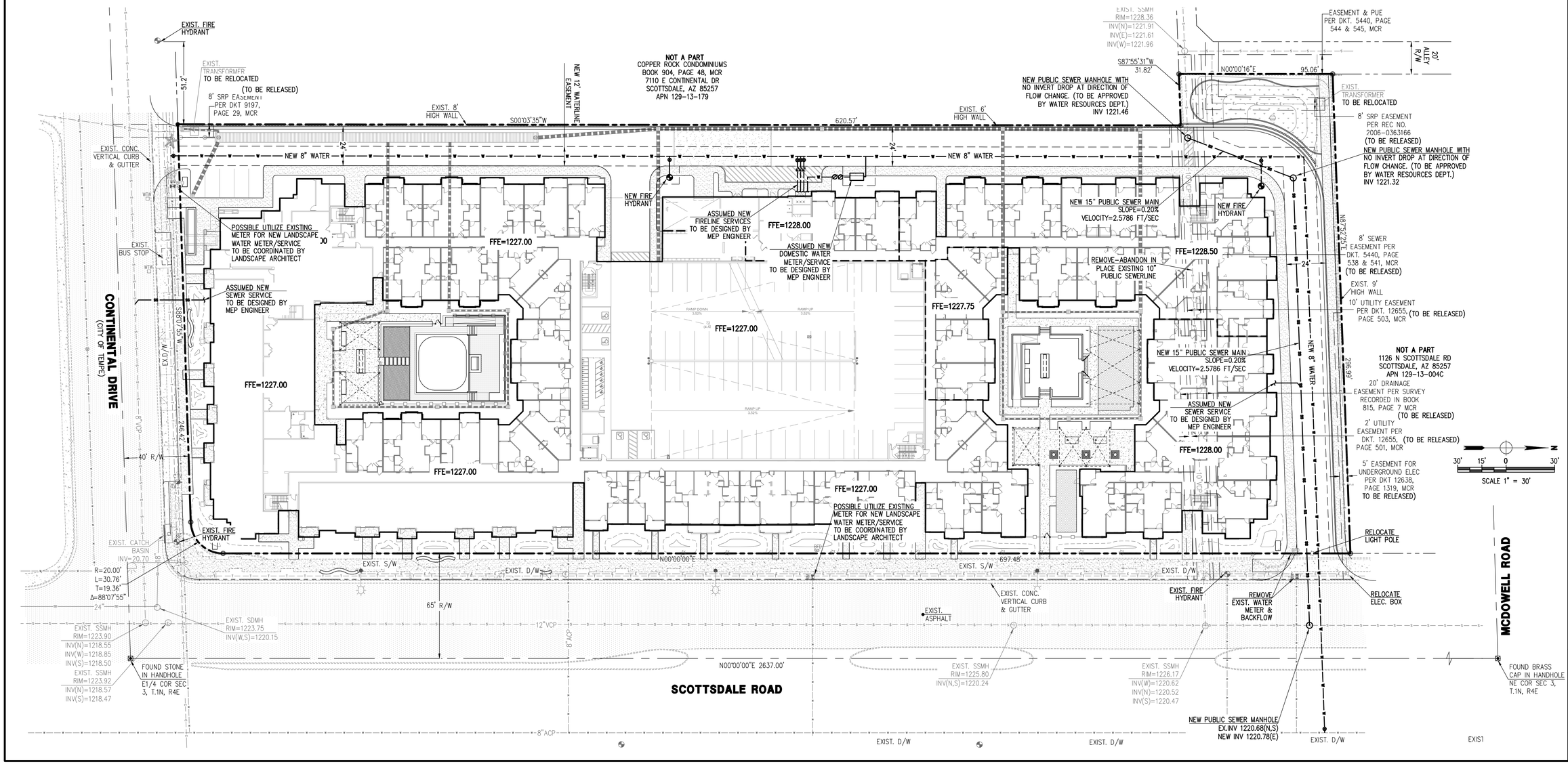
THE MONUMENT LINE OF SCOTTSDALE ROAD THE BEARING OF WHICH IS N00°00'00"W, AS SHOWN ON THE PLAT OF MARK MITSUBISHI, RECORDED IN BOOK 815, PAGE 7, MCR.

BENCHMARK

BRASS CAP IN HAND HOLE AT THE INTERSECTION OF SCOTTSDALE RD AND MCDOWELL ROAD HAVING AN ELEVATION OF 1230.69, CITY OF SCOTTSDALE DATUM, NAVD 88 DATUM, BM# 5032



VICINITY MAP
NTS



DATE: 06/15/20
JOB: 2004085
VERSION: 1.1
PLOT DATE: 06/15/20
SCALE: 1"=30'
DESIGNED BY: NP
DRAWN BY: DW
CHECKED BY: JB
DATE:
REVISIONS:

PRELIMINARY WATER & SEWER PLAN

ALTA CONTINENTAL
1000 N SCOTTSDALE RD,
SCOTTSDALE, AZ 85257

P 602 889 1984 | F 602 445 9482
8808 N CENTRAL AVE., SUITE 288
PHOENIX, AZ 85020
PHOENIX @ LDDENG.COM
Land DEVELOPMENT GROUP

PRELIMINARY NOT FOR CONSTRUCTION

PWS

1 OF 1

14-ZN-2018
9/1/2020

APPENDIX A-5
Fire Flow Test Results

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

SEE REVISED

Project Name:	Not Provided
Project Address:	Scottsdale Road & Continental Drive, Scottsdale, Arizona 85257
Arizona Flow Testing Project No.:	18175
Client Project No.:	1711151
Flow Test Permit No.:	C55397
Date and time flow test conducted:	May 22, 2018 at 7:00 AM
Data is current and reliable until:	November 22, 2018
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Phil Cipolla – City of Scottsdale-Inspector (602-828-0847)

expired

Raw Test Data

Static Pressure: **90.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **40.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **12.0 PSI Hyd A**
10.0 PSI Hyd B
(Measured in pounds per square inch)

Diffuser Orifice Diameter: 4 Inch
(Measured in inches)

Coefficient of Diffuser: 0.9 and .802

Flowing GPM: **2,700 GPM**
(Measured in gallons per minute)
1,489 GPM +1,211 GPM = 2,700 GPM

GPM @ 20 PSI: **3,237 GPM**

Data with 18 PSI Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

Residual Pressure: **22.0 PSI**
(Measured in pounds per square inch)

Distance between hydrants: See Below

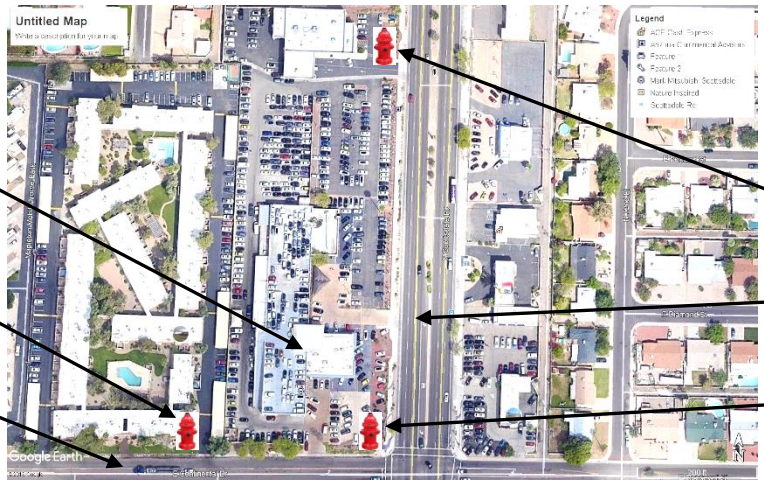
Main size: Not Provided

Flowing GPM: **2,700 GPM**

GPM @ 20 PSI: **2,757 GPM**

Flow Test Location
+

North



Project Site
Scottsdale Road &
Continental Drive

Flow Fire Hydrant A

East Continental Drive

Flow Fire Hydrant B

North Scottsdale Road

Pressure Fire Hydrant

14-ZN-2018
9/1/2020

APPENDIX A-6
Water Calculations

Number of units:	280
Average day demand per dwelling unit:	0.27 gpm (388.8 gpd)
Retail:	0.00111 x 10,000 = 11.1 gpm (15,980.82 gpd)
Average day demand:	**280 x 0.27+11.1 = 86.7 gpm (124,823.19 gpd)**

Maximum daily peaking factor:	2.0*ADD
Maximum daily demand per dwelling unit:	0.54 gpm (777.6 gpd)
Maximum daily demand - retail:	11.1 gpm (15,980.82 gpd)
Maximum day demand	**280 x 0.54+11.1 = 162.3 gpm (233,665.55 gpd)**

Peak hour demand factor:	3.5*ADD
Peak hour demand per dwelling unit:	0.945 gpm (1,360.8 gpd)
Peak hour demand - retail:	46.62 gpm (67,133 gpd)
Peak hour demand	**280 x 0.945 +46.62 = 311.22 gpm (448,067.73 gpd)**

Residential fire flow demand*:

*IFC 2018, Table B105.1

- Max. Building Area: **262,857 s.f.**
- For Construction **Type V-A**, min. required fire-flow is **6,750 gpm x 0.25** = 1,687.5 gpm or 2,500 gpm**

**Per Exception under IFC 2015, Sec. B105.2

TOTAL SITE DEMAND

Maximum day demand + Fire flow demand	**311.22 + 2,500 = 2,811gpm (2,811.22)**

APPENDIX A-7
Sanitary Sewer System Design Calculations

Manning's Formula

15" Pipe Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.16667
A = 0.3490
S = 0.0020 ft/ft

Q = 2.89 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.16667
S = 0.0020 ft/ft

V = 2.5 fps

Manning's Formula

6" Pipe Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.125
A = 0.1963
S = 0.010 ft/ft

Q = 0.56 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.125
S = 0.010 ft/ft

V = 2.86 fps

Residential densities are to assume 2.5 persons per dwelling unit. Multifamily densities exceeding 22 dwelling units per acre can assume 1.7 to 2.2 persons per unit.

Sewer Demand Calculations

ok, multifamily per DS&PM, 60+ units per acre

Average daily flow

Number of Units:	280
Average day demand per dwelling unit:	200
Average day demand:	**280 x 200 = 56,000 gpd**
Area of Retail:	**10,000**
Average day demand per s.f.:	**0.5**
Average day demand:	**5,000 gpd**
Total average daily flow:	**61,000 gpd = 0.0944 cfs**

PF should be 4 for residential and 3 for commerical

Calc error 0.4248cfs is 190gpm. Using DS&PM values this should be 166gpm

Peak daily flow

0.0944cfs x 4.5 = 0.42 cfs or 157 gpm

6" service line is connected to a proposed 8" sewer line that is tapped to the existing 8" public sewer main in the alley. Another 6" service line is connected to the sewer in Continental Drive. Building sewer service lines to be sized by the plumbing engineer at the time of the final design.

Capacity of 6" sewer line is **0.56** cfs > Peak Demand of **0.42 cfs**

Pool Backwash Flow Rate

100 gpm (0.22 cfs) assumed for preliminary purposes. Actual discharge and pipe sizing will be calculated at the time of final design. Current design plans for filter cartridge system that does not require pool backwash pipe installation.

266gpm

Sewer Peak Daily Flow

157 gpm + 100 gpm (pool) **257 gpm or 0.69 cfs**

Capacity of Proposed and Existing 15" Public Sewer = **2.89** cfs > Peak Demand of **0.69 cfs**
Capacity of Proposed and Existing 15" Public Sewer at Allowable d/D of 0.65 or 0.71 cfs (319 gpm) > 0.69 cfs (257 gpm)

What about 12" Scottsdale Rd sewer capacity?

REVISED AS REQUESTED

PRELIMINARY WATER AND SEWER REPORT

ALTA CONTINENTAL
NWC of Scottsdale Road & Continental Drive
1000 N Scottsdale Road
Scottsdale, AZ 85257

CASE NO. 14-ZN-2018

PRELIMINARY Basis of Design Report

- ☐ ACCEPTED
- ☑ ACCEPTED AS NOTED
- ☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE
SCOTTSDALE WATER
9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY ldillon DATE 9/23/2020

Address comments on following page and herein within final BOD reports. Note stipulations per following page.

Prepared for:
Five Star Development / Wood Partners

Submitted to:
City of Scottsdale
Planning & Development Department
7447 E. Indian School Rd, Suite 105
Scottsdale, AZ 85251

Prepared by:
Land Development Group, LLC
8808 N. Central Avenue, Suite 288
Phoenix, Arizona 85020
Contact: Nick Prodanov, PE, PMP
P: 602 889 1984

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41005 NICKOLA J. PRODANOV Date Signed 8/26/20 ARIZONA, U.S.A.

Rev. 1 August 17th, 2020
June 16th, 2020

Water Resources comments, LDillon 9/23/2020

Sewer:
1)Stipulation: Per Water Resources calculations there is an overage of 109gpm on Scottsdale Rd 12". Requirement will be to design and construct a 5ft diameter diversion manhole at Skysong Blvd and Scottsdale Rd that diverts Scottsdale Rd flows into existing 12" line (coming from the north) into the Skysong Blvd sewer being extended from Papago Plaza that flows east.
2) Stipulation: Design and install new 15" sewer measuring approximately 365ft from existing alley near northwest corner of property and extend out to Scottsdale Rd 12" sewer and connect with one new 5ft diameter manhole. 2 additional 5ft diameter manholes shall be installed onsite along with this new line. (Currently shown on utility plan)
3) Address in final BOD: Connection angle to Scottsdale Rd sewer must be 90 degrees or less (currently 93 degrees). MAG nor City allow.
4) Confirmation/Address in Final BOD: Slope and lack of MH drop approved on new 15" sewer if necessary. In final BOD verify via survey the upstream and downstream manhole lid and invert elevations to verify slope. If pipe slope allows provide 0.1ft required drop over manhole.
5) Confirmation: Proposed 183gpm to Continental Drive + 50gpm of existing flows per WR estimate= 233gpm. OK @ d/D=0.65 and slope given.
6)Address in final BOD: Sewer laterals shall be per MAG 440-3. DS&PM 7-1.409, B.

Water:
1) Stipulation: Provide 14ft min water line easement. When in fully accessible drive aisle a 14ft foot easement is the minimum required water line only easement (currently show 12ft on west side drive aisle) DS&PM 6-1.419
2) Stipulation: If existing 8" fire line off of Scottsdale Road is not to be used for the development remove back to main and replace tee with DIP spool piece. May be possible to abandon line in place but line needs to be disconnected and tee replaced with DIP spool. DS&PM 6-1.408
3) Stipulation: There are 7 domestic meters proposed on the site plan (6 new). Cannot manifold meters serving a single building. Utilize 1 meter for 1 building. Meters 3" and larger are required to be in a vault. Revise in final BOD report. DS&PM 6-1.416,E
4) Address in final BOD: Centerline clearance between new sewer and new water shall be 7-8ft (8ft preferred to maximize clearance at manholes)
5) Address in final BOD: Where tapping ACP main pipe portion of ACP main shall be replaced with DIP main. DS&PM 6-1.408 and 6-1.413.

TABLE OF CONTENTS

APPENDICES

Rev. 1 August 17th, 2020
June 16th, 2020

1. INTRODUCTION

This preliminary water report and related water and sewer plan have been developed in accordance with the current Arizona, Maricopa County and City of Scottsdale ordinances, standards and policies for design and operation of domestic and fire water facilities. It provides engineering analysis and assessment of the existing and proposed water systems that currently service and will be installed for the subject development, located at 1000 N Scottsdale Road, Scottsdale, AZ 85257, and also being a portion of the NE ¼ of Section 11, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to Appendix A-1 – Vicinity Map.

The parcel is located within the Scottsdale Q.S. 12-44. The project site consists of a fully developed parcels, with a total area of 4.429 acres, located at the northwest corner of Scottsdale Road and Continental Drive – 1000 N Scottsdale Road, Scottsdale, AZ 85257. The property historically housed car dealerships. It is zoned C-3 and it is bounded by Continental Drive on the south, Scottsdale Road on the east, a commercial development on the north, and multifamily residential development on the west.

The proposed mixed-use development consists of 4-story building with roughly 280 multi-family residential units and roughly 10,000 s.f. of commercial space, parking garage and driveways. Vehicular circulation is provided by two driveway entrances on the northeast and southwest sides of the site and a 24’ wide drive that is continuous around the building from the north and west sides. Surface parking is provided in the parking garage.

This report provides results for the water service demands for Average Day, Maximum Day, Peak Hour and Fire Flow rates for the entire development. No phasing is anticipated for this project. The results provided herein demonstrate that the proposed water system is capable of providing for the estimated demand and is in compliance with the City standards and performance. No wells or on-site water storage are proposed with this development. The procedures used herein are derived from, and performed with, currently accepted engineering methodologies and practices.

2. EXISTING CONDITIONS

Currently the site is fully developed with asphalt pavement and a single-story commercial building. The entire property will be demolished and cleared with the proposed project. The lot consists primarily of impervious surfaces with small DG landscape area along the frontage of Scottsdale Road. The overall existing terrain on site is flat with overall grade change from north to south at about 3’. The land in the vicinity generally slopes in southerly direction. The site has an average elevation of 1226 (NAVD88), a peak elevation of 1228 and the lowest elevation of 1224.

City of Scottsdale is the water and sanitary provider for this project. Based on the obtained by the City Water and Sewer Maps, 12" VCP public sewer main runs in Scottsdale Road, and 8” VCP sewer main in Continental Drive. There is also a 10” VCP main that runs in an 8’ sewer easement, west to east, in the north portion of the site. Most likely existing buildings are served off the latter 10” VCP

see utility notes on what to do with this if not used

sewer. The project is located within Pressure Zone #1 with Ground Elevation Ranges of 1250 to 1330.

There is an 8" ACP water main in Scottsdale Road, and two unknown size mains in the Continental Drive right of way. The water main that runs north of the sidewalk in Continental is a dead-end line that serves the multifamily development to the west of the subject project. Two test wells were noted on this line. Three water meters supply domestic and landscape irrigation water to the existing site. There is an 8" ACP line connected to the 8" main in Scottsdale Road that is used for fire sprinklers system. There are two fire hydrants in the street – NWC of Scottsdale Road and Continental Drive and another one near the northeast corner of the site.

3. DESIGN CRITERIA AND PROJECTED WATER DEMANDS

X280 units= 76gpm

The following design parameters and requirements were derived from the City of Scottsdale Standards and Policies manual, Figure 6.1-2:
Average day demand per dwelling unit: **185.3 gpd (0.27 gpm per unit)**

Average Day Demand for retail/amenity: 0.8 / s.f. or **9,634** gpd (0.00111 gpm per s.f or **13.37 gpm**)

X10,000ft2= 11.1gpm

Maximum daily peaking factor: **2.0**
87X2= 174gpm
Peak hour demand factor: **3.5**
305gpm

City of Scottsdale Fire Department follows 2018 International Fire Code.
Per the Appendix B, Section B105.2 of 2018 IFC, up to a 75% reduction of the fire flow can be granted if an approved automatic sprinkler system is installed. The resulting fire flow shall not be less than the required minimum of 1,500 gpm.

Proposed construction type is V-A with the following breakdown of the square footages per building use:

- Retail: 10,000
- Rentable/Residential: 262,857 SF
- Garage: 19,603 SF
- Surface Parking: 493 SF

MINIMUM REQUIRED FIRE FLOW AND FLOW DURATION FOR BUILDINGS

BLDG DESIGNATION	CONSTRUCTION TYPE	GROSS AREA (s.f.)	FIRE FLOW (gpm)	FLOW DURATION (hrs)
Garage	V-A	19,603	2,500 (1,500)*	2
Residential Building	V-A	262,857	8,000 (2,500)*	4

*Max from 75% Reduction Applied for Fully Sprinklered Building and 2,500 gpm

The static pressure in the distribution system should not exceed 120 pounds per square inch (psi), and the system shall be designed to maintain a minimum residual pressure of 50 psi at the highest, finished, floor level to be served by system pressure under normal daily operating conditions. The system is designed to maintain 30 psi minimum pressure under the design fire flow requirements. The 30 psi minimum pressure requirement provides a 10 psi safety factor to account for aging infrastructure and flexibility in locating pressure zone boundaries.

7 domestic meters shown. Manifolding not allowed. 1 meter for 1 building

4. PROPOSED WATER PLAN AND HYDRAULIC MODEL

New public 8" water main is proposed to loop around the proposed development. It is connected to the existing 8" mains in Scottsdale Road and Continental Drive. Fire sprinkler taps are connected to the new 8" water line. In addition, two new fire hydrants are proposed at the back side of the property to provide for minimum fire hydrant coverage. FDCs will be installed on the north and south sides of the buildings. A fire lane will be provided on the north and west sides.

The project will be served by six 2" water meters. Existing 1" water meter is proposed to serve the landscape needs. Sizes of the water meters will be verified by the plumbing engineer during the design process. All existing services to the water mains in the streets. Per the COS Design Standards & Policies Manual, the recommended max. capacity of 2" water meter is 80 gpm.

The demand used for the required fire flow is 2,500 gpm, which is the maximum of the 2,500 gpm required and the 75% reduction of the required 8,000 gpm due to the fact that the buildings will be fully sprinklered as per the 2018 IFC, Appendix B, Section B105.2. Water systems were analyzed for peak hour and maximum day with fire demand.

A fire flow test was conducted for the site on August 14th, 2020 by Arizona Flow Testing. The flow test resulted in 5,363 gpm of available water at 20 psi and a residual pressure of 42 psi.
The overall fire flow is provided by two new fire hydrants connected at the proposed 8" main and two existing fire hydrants in the City right of way. The minimum pressure of 30 psi shall be exceeded while modeling the system with the total required fire flow demand. The velocities in the water main shall be maintained below the maximum of 10 ft/sec for the required fire flow demand.

Refer to Appendix A-5 for fire flow test results and Appendix A-6 for water calculations.

slope and lack of MH drop approved , no other option, on final BOD verify via survey the lid and invert elevations

opinion not requested, analysis requested. discussion and subsequent analysis was requested, Water Resources phone number provided in previous comments, no contact made

5. SANITARY SEWER SYSTEM

Existing 10" public sewer line is in conflict with the proposed development and will have to be removed or abandoned. New 15" public sewer main is proposed to be connected into the existing 12" VCP public sewer under Scottsdale Road. The proposed sewer line is located along the north property line under the new driveway. Minimum slope of 0.22% will be used for the line. Three new pubic sewer manholes with no invert drop are suggested with the development of the sewer line, which will be subject to approval by the Water Resources Department.

The maximum d/D of the sewer mains in Scottsdale Road and Continental Drive at ultimate peak flow per the City of Scottsdale Design Standards and Policies Manual is 0.65. This equates to a maximum allowable discharge of 543 gpm (1.21 cfs) at a velocity of 2.23 fps at slope of 0.2% for the sewer main in Scottsdale Road. The maximum allowable discharge of 229 gpm (0.51 cfs) at a velocity of 2.09 fps at slope of 0.3%.

We have calculated that the peak discharge from this development will be 266 gpm. Three quarters of the building discharge will be redirected to Scottsdale Road sewer main.
Based on the analysis performed, it is our opinion that the public sewer main that this site discharges into has an adequate capacity.

You are proposing 183gpm to Continental + 50gpm of existing per WR estimate= 233gpm. OK @ d/D=0.65 and slope given.

Water Resources assumes this pool backwash discharge is out onto Continental as pool in on this side.

We have also estimated the sewer discharge from the site using The City of Scottsdale Design Standards & Polices Manual. The average daily flow was estimated at 0.0944 cfs. The peak discharge was calculated by increasing the average daily flow by a factor of 4.0 for the residential and 3.0 for the commercial portion, which is a total of 0.3698 cfs. Using Manning's Equation, we calculated that the proposed 15-inch sewer line at a minimum of 0.2% have a velocity of 2.5 fps flowing full with a capacity of 3.029 cfs. Current design plans for filter cartridge system that does not require pool backwash pipe installation. If Pool backwash is desired, it shall be connected to the sanitary sewer system and to not discharge to the storm drain system. For the purpose of the design we have assumed a pool backwash flow rate of 100 gpm (0.22 cfs). Actual backwash discharge rate shall not exceed 100 gpm. Backwash pump and pipe sizing will be done by the pool designer under separate permit. Refer to Sanitary Sewer System Design Calculations in Appendix A-7.

6. CONCLUSIONS AND RECOMMENDATIONS

mortar lined, AWWA/City spec

The proposed development and associated new water system comply with the City design standards and policies and the Scottsdale Integrated Water Master Report. It is anticipated that the construction would start in third quarter of 2020 and will continue for 24 months.

Specified water lines are 8 inch in diameter and shall be ductile iron pipe (DIP) with a minimum pressure class of 350. All ductile iron water lines shall be installed with polyethylene wrapping. Existing tees, tapping sleeves and related appurtenances that are not utilized by the development shall be removed by the contractor. A minimum of 3-foot section of pipe shall be removed and replaced, with no more than 6-feet remaining to the nearest joint.

Fittings cut into the existing 8" ACP main within 6-feet of another fitting or joint will require the short section of pipe to be removed and replaced with DIP. No water line will be deflected either vertically or horizontally, in excess of the recommended (but not exceeding 4 degrees) by the

Per Water Resources calculations there is an overage of 109gpm on Scottsdale Rd 12". Requirement will be to construct a diversion manhole at Skysong Blvd and Scottsdale Rd that diverts Scottsdale Rd flows from the north in the Skysong Blvd sewer that flows east.

manufacturer of the pipe or coupling, without the appropriate use of bends or offsets. Fittings may be required where more than 2 pipe lengths are deflected.

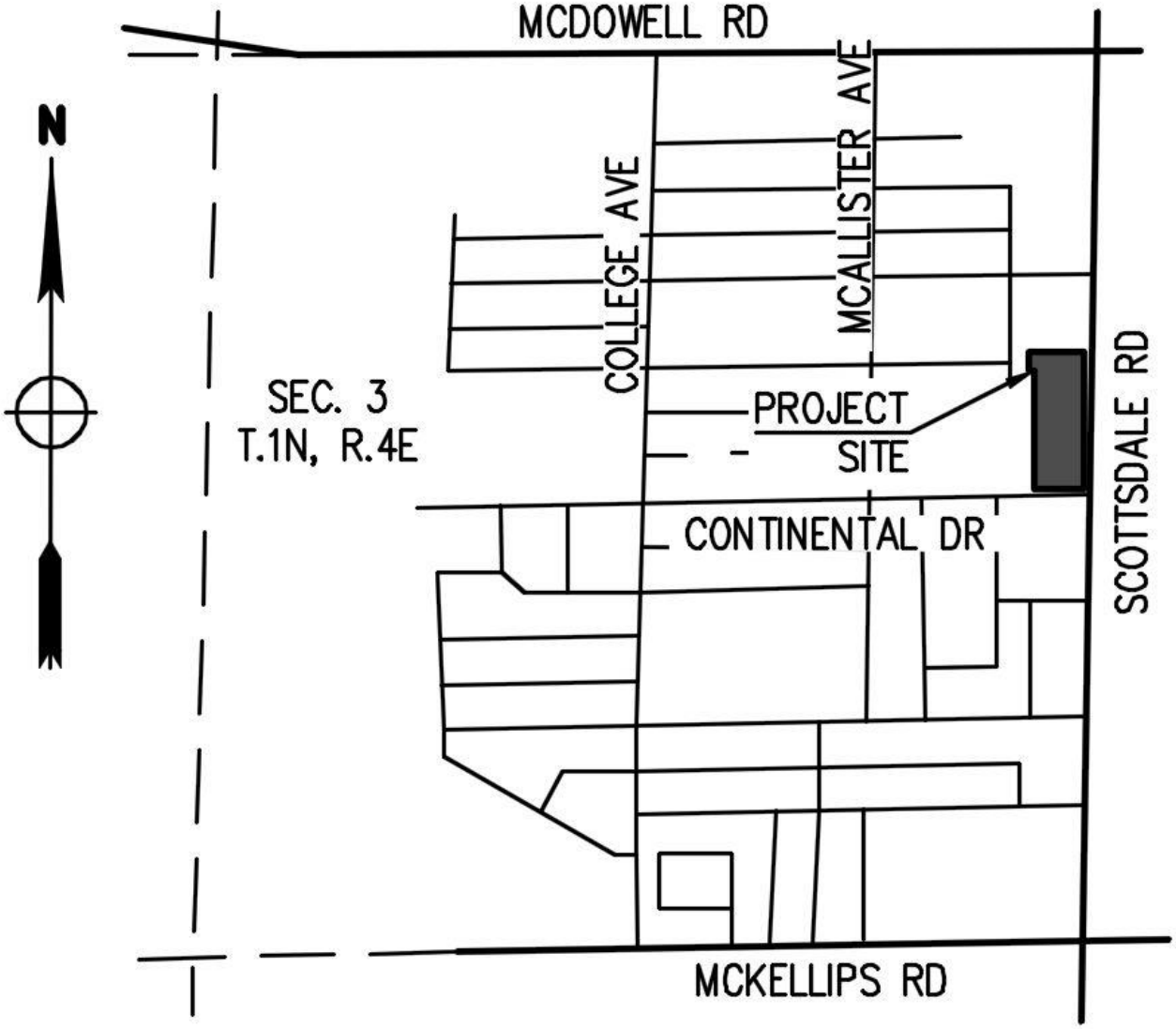
Shutoff valves will be installed on water mains at locations within the distribution system that allow sections of the system to be taken out of service for repairs or maintenance. A sufficient number of valves are provided on the proposed water lines so that inconvenience and sanitary hazards will be minimized during repairs. Maximum spacing of water distribution main isolation valves does not exceed 500 foot.

All water mains shall maintain 3 feet horizontal clearance to dry utilities. Water and sewer mains are placed under the paved section of the driveways. Vertical separation of water and sanitary sewer lines shall be in compliance with the COS Standard Detail No. 2401. For minimum clearance under culverts, storm drains, and other utilities, contractor shall refer to COS Standard Detail No. 2370 and 2372. The vertical realignment of the water mains shall be constructed of ductile iron pipe and shall not be deflected or swept. All metered services will require the installation of an approved backflow prevention device immediately adjacent to the meter on private property unless approved otherwise by the Water Resources Department.

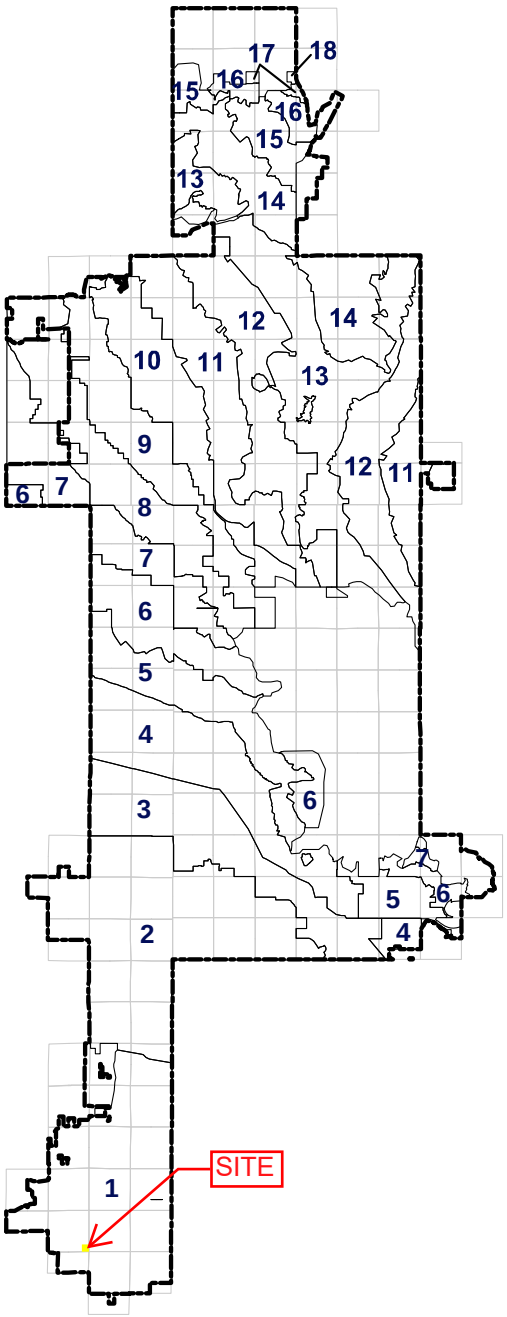
7. REFERENCES

- City of Scottsdale Design Standards & Policies Manual
- City of Scottsdale Pressure Zone Map
- City of Scottsdale Quarter Section Maps
- ADEQ Engineering Bulletin No. 10, “Guidelines for the Construction of Water Systems”

APPENDIX A-1
Vicinity Map



APPENDIX A-2
Pressure Zone Map



Zone	Ground Elevation Range (Ft.)	
1	1180-1280	1226
1A	1250-1330	
2A	1280-1330	
2	1330-1440	
3	1440-1550	
4	1510-1650	
4E	1550-1650	
5	1650-1790	
5E	1650-1750	
6	1790-1920	
6E	1750-1934	
7	1920-2050	
7E	1934-2065	
8	2050-2180	
8E	2065-2200	
9	2180-2310	
10	2310-2440	
11,11E	2440-2570	
12,12E	2570-2700	
13	2700-2830	
14	2830-2960	
15	2960-3090	

FIGURE 6.1-3 PRESSURE ZONE MAP

6-1.300 WATER FACILITIES

Water facilities (wells, reservoirs and booster pump stations) are typically designed and constructed by the city through its capital improvement program. Developers needing to construct water facilities should contact the Water Resources Department and request a meeting. The developer should be prepared to address how the proposed system will conform to the Integrated Water Master Plan. The city will address design issues, the review process for facilities and any potential city cost participation.

APPENDIX A-3
Public Water and Sewer Maps

13-44

12-43

12-45

11-44

12-NOV-17

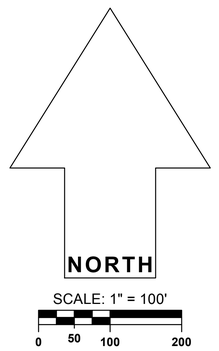
GENERAL NOTES:

- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS 'CALCULATED' ON THE MAP.

LEGEND:

- Water Valve
- Non-potable Water Valve
- Fire Hydrant
- Water Blowoff
- Water Main Reducer
- Water Sample Station
- Water Air Release Valve
- Non-potable Water Air Release Valve
- Water Pressure Reducing Valve
- Water Vault
- Water Manhole
- Non-Potable Water Manhole
- Water Pump
- Water Main
- Non-Potable Water Main
- Fire Line
- Water Service
- Non-Scottsdale Water Main
- Sewer Manhole
- Sewer Cleanout
- Sewer Lift Station
- Sewer Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Non-Scottsdale Sewer Main
- Sewer Service

VICINITY MAP



WATER & SEWER

QUARTER SECTION MAP

12-44

NE 1/4 SEC. 3 T1N R4E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

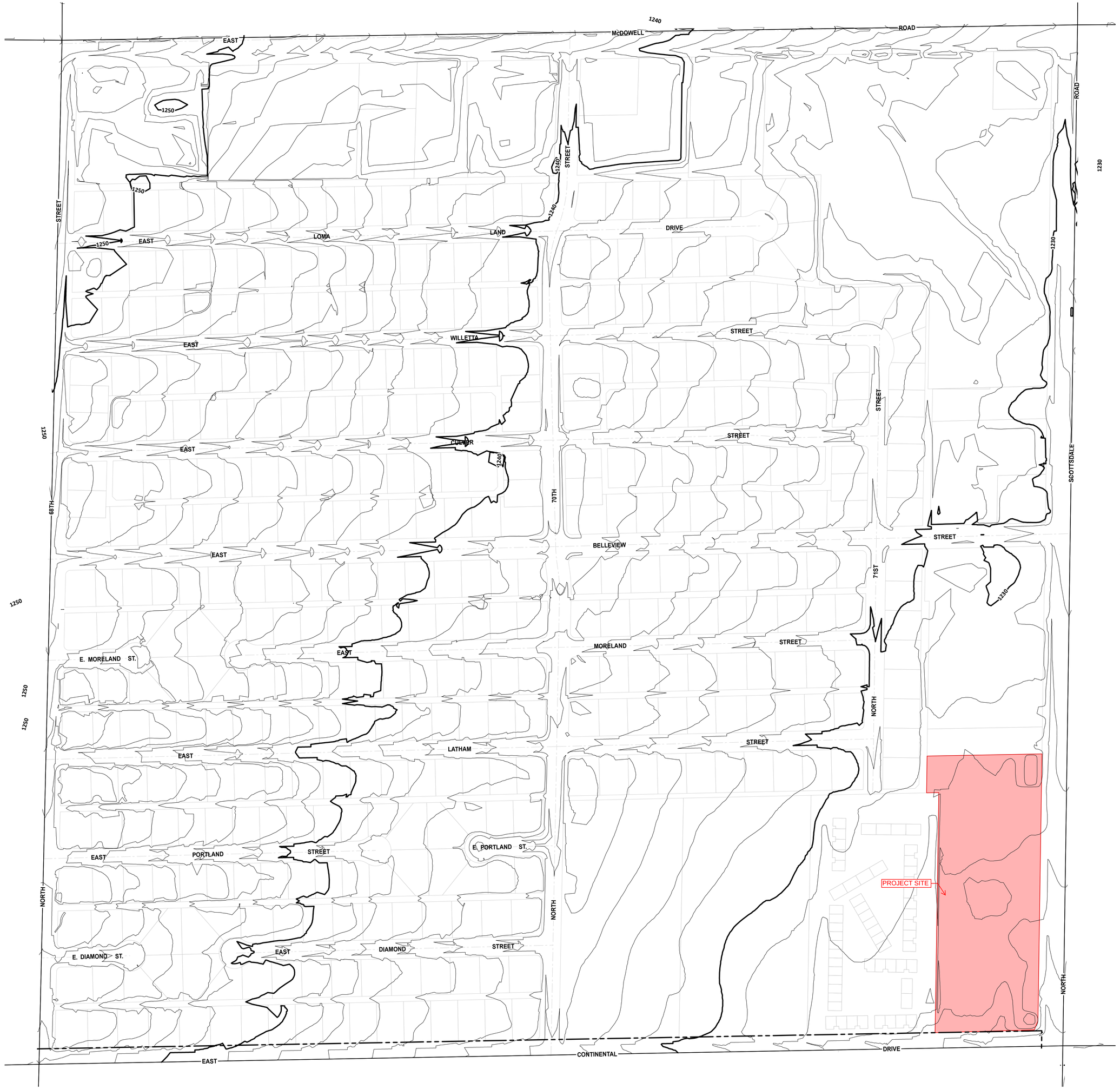
14-ZN-2018
9/1/2020

13-44

12-43

12-45

11-44



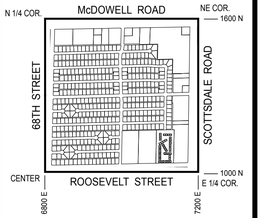
28-APR-14

GENERAL NOTES:

- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS 'CALCULATED' ON THE MAP.

LEGEND:

VICINITY MAP



NORTH

SCALE: 1" = 100'

0 50 100 200

The map scale of 1" = 100' is based on a full size print of 30" x 36"

CONTOUR

QUARTER SECTION MAP

12-44

NE 1/4 SEC. 3 T1N R4E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

14-ZN-2018
9/1/2020

APPENDIX A-4
Preliminary Water and Sewer Plan

PRELIMINARY WATER & SEWER PLAN
ALTA CONTINENTAL
1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

SUBDIVISION PLAT LOCATED WITHIN A PORTION OF THE E 1/2 OF THE SE 1/4 OF THE NE 1/4 OF SECTION 11, T.3N, R.4E OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- MONUMENT LINE
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- SEWER CLEANOUT
- LIGHT POLE
- SEWER MANHOLE
- STORM DRAIN INLET
- TRANSFORMER
- TELE COMMUNICATIONS PEDESTAL
- C — CATV, PHONE
- G — GAS LINE
- T — CATV, PHONE
- S — SEWER LINE
- W — WATER LINE
- E — ELECTRIC LINE
- FL — FIRE LINE

SITE DATA

APN:	129-13-002G, 129-13-003E, 129-13-003D, 129-13-004D
ADDRESS:	1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257
LOT AREA:	192,943 S.F (4.429 AC.)
Q.S.:	12-44

FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY # 045012	PANEL # 2235 OF 4425	SUFFIX L	BASE FLOOD ELEVATION N/A
MAP # 04013C	PANEL DATE 10/16/2015	ZONE X*	

*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN IS SITUATED (IN) SCOTTSDALE, IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS:

LOT 1, A PROPERTY ASSEMBLAGE IN THE CITY OF SCOTTSDALE, ACCORDING TO BOOK 815 OF MAPS, PAGE 7, RECORDS OF MARICOPA COUNTY, ARIZONA LOCATED IN THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 3, TOWNSHIP 1 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

APN: 129-13-002G, 129-13-002K, 129-13-003D, 129-13-002J, 129-13-004D, 129-13-004E

BASIS OF BEARINGS

THE MONUMENT LINE OF SCOTTSDALE ROAD THE BEARING OF WHICH IS N00°00'00"W, AS SHOWN ON THE PLAT OF MARK MITSUBISHI, RECORDED IN BOOK 815, PAGE 7, MCR.

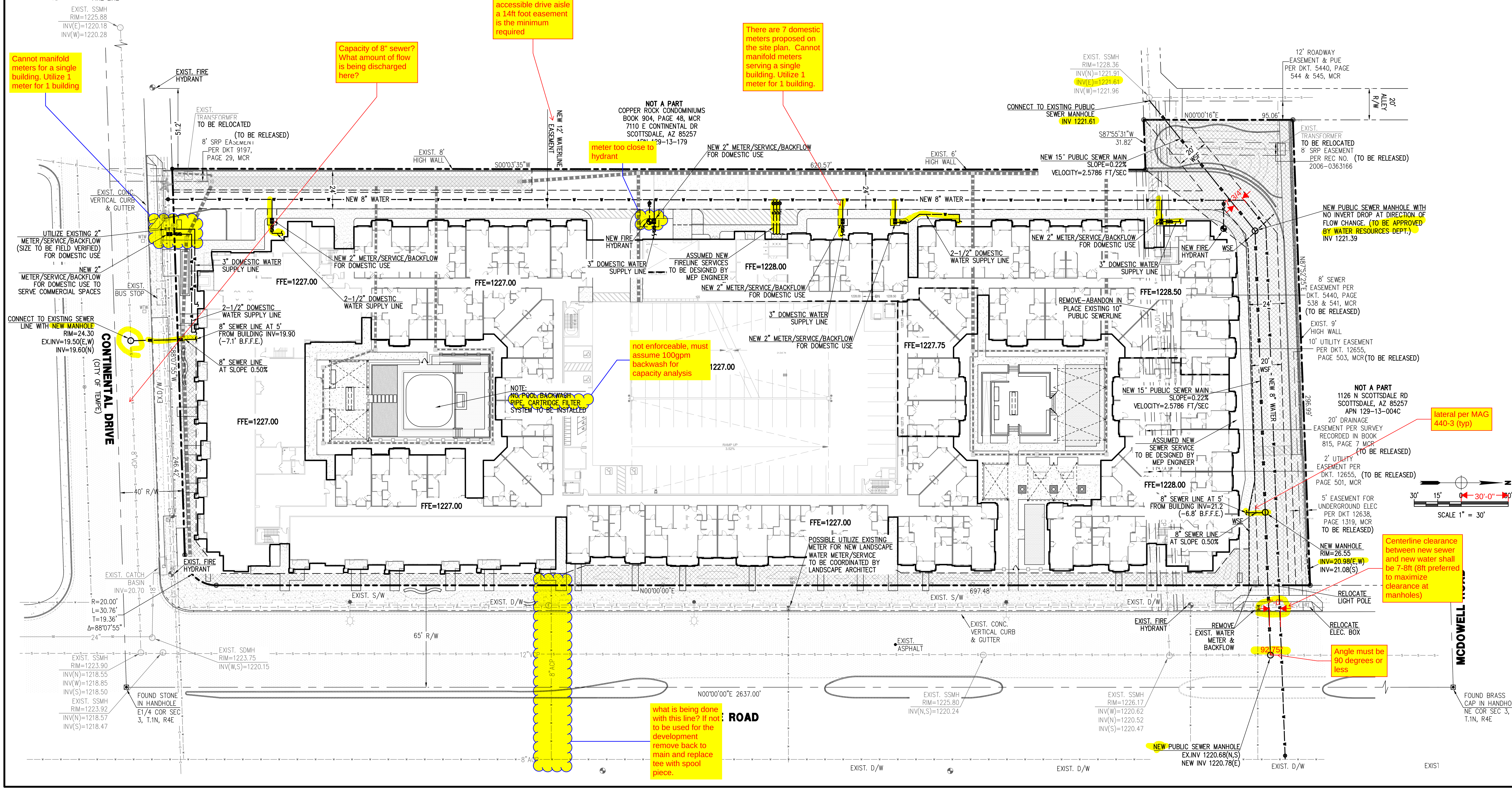
BENCHMARK

BRASS CAP IN HAND HOLE AT THE INTERSECTION OF SCOTTSDALE RD AND MCDOWELL ROAD HAVING AN ELEVATION OF 1230.69, CITY OF SCOTTSDALE DATUM, NAVD 88 DATUM, BM# 5032

VICINITY MAP

NTS

MCDOWELL RD
COLLEGE AVE
MCALLISTER AVE
SCOTTSDALE RD
SEC. 3 T.1N, R.4E
PROJECT SITE
CONTINENTAL DR
MCKELLIPS RD



Cannot manifold meters for a single building. Utilize 1 meter for 1 building
Capacity of 8" sewer? What amount of flow is being discharged here?
when in fully accessible drive aisle a 14ft foot easement is the minimum required
There are 7 domestic meters proposed on the site plan. Cannot manifold meters serving a single building. Utilize 1 meter for 1 building.
meter too close to hydrant
not enforceable, must assume 100gpm backwash for capacity analysis
lateral per MAG 440-3 (typ)
Centerline clearance between new sewer and new water shall be 7-8ft (8ft preferred to maximize clearance at manholes)
Angle must be 90 degrees or less
what is being done with this line? If not to be used for the development remove back to main and replace tee with spool piece.
EXIST. SSMH RIM=1225.88 INV(E)=1220.18 INV(W)=1220.28
EXIST. FIRE HYDRANT
EXIST. TRANSFORMER TO BE RELOCATED (TO BE RELEASED)
8' SRP EASEMENT PER DKT 9197, PAGE 29, MCR
NOT A PART COPPER ROCK CONDOMINIUMS BOOK 904, PAGE 48, MCR 7110 E CONTINENTAL DR SCOTTSDALE, AZ 85257
NEW 12" WATERLINE EASEMENT
EXIST. 8' HIGH WALL
S00°03'35"W
NEW 2" METER/SERVICE/BACKFLOW FOR DOMESTIC USE
620.57'
EXIST. 6' HIGH WALL
EXIST. SSMH RIM=1228.36 INV(N)=1221.91 INV(E)=1221.61 INV(W)=1221.96
CONNECT TO EXISTING PUBLIC SEWER MANHOLE INV 1221.61
S87°55'31"W 31.82'
NEW 15" PUBLIC SEWER MAIN SLOPE=0.22% VELOCITY=2.5786 FT/SEC
N00°00'16"E 95.06'
12' ROADWAY EASEMENT & PUE PER DKT. 5440, PAGE 544 & 545, MCR
20' ALLEY R/W
EXIST. TRANSFORMER TO BE RELOCATED 8' SRP EASEMENT PER REC NO. 2006-0363166 (TO BE RELEASED)
NEW 8" WATER
EXIST. CONC. VERTICAL CURB & GUTTER
UTILIZE EXISTING 2" METER/SERVICE/BACKFLOW (SIZE TO BE FIELD VERIFIED) FOR DOMESTIC USE
NEW 2" METER/SERVICE/BACKFLOW FOR DOMESTIC USE TO SERVE COMMERCIAL SPACES
EXIST. BUS STOP
CONNECT TO EXISTING SEWER LINE WITH NEW MANHOLE RIM=24.30 EX.INV=19.50(E,W) INV=19.60(N)
3" DOMESTIC WATER SUPPLY LINE
NEW 2" METER/SERVICE/BACKFLOW FOR DOMESTIC USE
FFE=1227.00
2-1/2" DOMESTIC WATER SUPPLY LINE
8" SEWER LINE AT 5' FROM BUILDING INV=19.90 (-7.1' B.F.F.E.)
8" SEWER LINE AT SLOPE 0.50%
NEW FIRE HYDRANT
3" DOMESTIC WATER SUPPLY LINE
ASSUMED NEW FIRELINE SERVICES TO BE DESIGNED BY MEP ENGINEER
FFE=1228.00
NEW 2" METER/SERVICE/BACKFLOW FOR DOMESTIC USE
3" DOMESTIC WATER SUPPLY LINE
NEW 2" METER/SERVICE/BACKFLOW FOR DOMESTIC USE
FFE=1227.75
2-1/2" DOMESTIC WATER SUPPLY LINE
3" DOMESTIC WATER SUPPLY LINE
NEW FIRE HYDRANT
REMOVE-ABANDON IN PLACE EXISTING 10" PUBLIC SEWERLINE
FFE=1228.50
NEW PUBLIC SEWER MANHOLE WITH NO INVERT DROP AT DIRECTION OF FLOW CHANGE. (TO BE APPROVED BY WATER RESOURCES DEPT.) INV 1221.39
8' SEWER EASEMENT PER DKT. 5440, PAGE 538 & 541, MCR (TO BE RELEASED)
EXIST. 9' HIGH WALL
10' UTILITY EASEMENT PER DKT. 12655, PAGE 503, MCR (TO BE RELEASED)
NOTE: NO POOL BACKWASH PIPE, CARTRIDGE FILTER SYSTEM TO BE INSTALLED
FFE=1227.00
NEW 15" PUBLIC SEWER MAIN SLOPE=0.22% VELOCITY=2.5786 FT/SEC
ASSUMED NEW SEWER SERVICE TO BE DESIGNED BY MEP ENGINEER
NEW 8" WATER
296.99'
NOT A PART 1126 N SCOTTSDALE RD SCOTTSDALE, AZ 85257 APN 129-13-004C
20' DRAINAGE EASEMENT PER SURVEY RECORDED IN BOOK 815, PAGE 7 MCR (TO BE RELEASED)
2' UTILITY EASEMENT PER DKT. 12655, PAGE 501, MCR (TO BE RELEASED)
FFE=1228.00
8" SEWER LINE AT 5' FROM BUILDING INV=21.2 (-6.8' B.F.F.E.)
8" SEWER LINE AT SLOPE 0.50%
5' EASEMENT FOR UNDERGROUND ELEC PER DKT 12638, PAGE 1319, MCR TO BE RELEASED)
NEW MANHOLE RIM=26.55 INV=20.98(E,W) INV=21.08(S)
SCALE 1" = 30'
CONTINENTAL DRIVE (CITY OF TEMPE)
40' R/W
246.42'
S89°07'55"W
EXIST. FIRE HYDRANT
FFE=1227.00
FFE=1227.00
FFE=1227.00
POSSIBLE UTILIZE EXISTING METER FOR NEW LANDSCAPE WATER METER/SERVICE TO BE COORDINATED BY LANDSCAPE ARCHITECT
EXIST. CATCH BASIN INV=20.70
R=20.00' L=30.76' T=19.36' Δ=88°07'55"
N00°00'00"E 697.48'
EXIST. S/W
EXIST. D/W
65' R/W
EXIST. CONC. VERTICAL CURB & GUTTER
EXIST. ASPHALT
EXIST. FIRE HYDRANT
REMOVE EXIST. WATER METER & BACKFLOW
RELOCATE LIGHT POLE
RELOCATE ELEC. BOX
MCDOWELL ROAD
EXIST. SDMH RIM=1223.75 INV(W,S)=1220.15
EXIST. SSMH RIM=1223.90 INV(E)=1218.55 INV(W)=1218.85 INV(S)=1218.50
EXIST. SSMH RIM=1223.92 INV(N)=1218.57 INV(S)=1218.47
FOUND STONE IN HANDHOLE E1/4 COR SEC 3, T.1N, R4E
N00°00'00"E 2637.00'
EXIST. SSMH RIM=1225.80 INV(N,S)=1220.24
EXIST. SSMH RIM=1226.17 INV(W)=1220.62 INV(N)=1220.52 INV(S)=1220.47
NEW PUBLIC SEWER MANHOLE EX.INV 1220.68(N,S) NEW INV 1220.78(E)
FOUND BRASS CAP IN HANDHOLE NE COR SEC 3, T.1N, R4E
92.75°
12" W
8" ACP

REVISIONS:	
DATE:	
SCALE: 1"=30'	DATE: 08/17/20
DESIGNED BY: NP	JOB: 2004085
DRAWN BY: DW	VERSION: 1.1
CHECKED BY: JI	PLOT DATE: 08/17/20

PRELIMINARY WATER & SEWER PLAN

ALTA CONTINENTAL 1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

P 602 889 1984 | F 602 445 9482
8808 N CENTRAL AVE., SUITE 288
PHOENIX, AZ 85020
PHOENIX @ LDGENG.COM
land DEVELOPMENT GROUP

PRELIMINARY NOT FOR CONSTRUCTION

PWS

1 OF 1

14-ZN-2018
9/1/2020

APPENDIX A-5
Fire Flow Test Results

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Not Provided
Project Address:	Scottsdale Road & Continental Drive, Scottsdale, Arizona, 85251
Client Project No.:	2004085
Arizona Flow Testing Project No.:	20311
Flow Test Permit No.:	C62897
Date and time flow test conducted:	August 14, 2020 at 6:45 AM
Data is current and reliable until:	February 14, 2021
Conducted by:	F. Vaughan & S. Ballard – Az. Flow Testing, LLC (480-250-8154)
Coordinated by:	Ray Padilla –City of Scottsdale-Inspector (602-541-0586)

Raw Test Data

Static Pressure: **86.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **56.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **36.0 PSI Hyd A**
14.0 PSI Hyd B
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One 4-inch Hose Monster (B)
(Measured in inches) One 4 inch Pollard Diffuser (A)

Coefficient of Diffuser: 0.7875/(B) and 0.9/(A)

Flowing GPM: **3,985 GPM**
(Measured in gallons per minute)
2,578 GPM + 1,407 GPM = 3,985 GPM

GPM @ 20 PSI: **6,100 GPM**

Data with 14 PSI Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **42.0 PSI**
(Measured in pounds per square inch)

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

Distance between hydrants: See Below

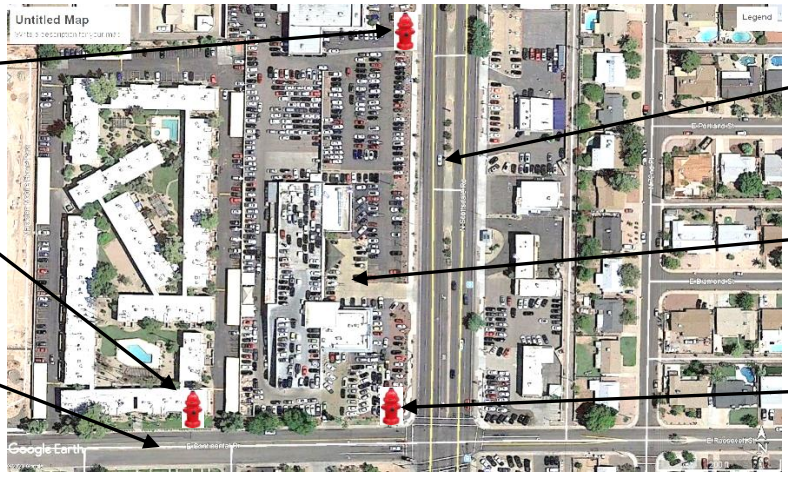
Main size: Not Provided

Flowing GPM: **3,985 GPM**

GPM @ 20 PSI**:** **5,363 GPM**

Flow Test Location

North



Flow Fire Hydrant B (640 Feet from Pressure Hydrant)

Flow Fire Hydrant A (310 Feet from Pressure Hydrant)

East Continental Drive

North Scottsdale Road

Project Site Scottsdale Road & Continental Drive (NWC)

Pressure Fire Hydrant

APPENDIX A-6
Water Calculations

Number of units:	280
Average day demand per dwelling unit:	0.27 gpm (388.8 gpd)
Retail:	0.00111 x 10,000 = 11.1 gpm (15,980.82 gpd)
Average day demand:	**280 x 0.27+11.1 = 86.7 gpm (124,823.19 gpd)**

Maximum daily peaking factor:	2.0*ADD
Maximum daily demand per dwelling unit:	0.54 gpm (777.6 gpd)
Maximum daily demand - retail:	11.1 gpm (15,980.82 gpd)
Maximum day demand	**280 x 0.54+11.1 = 162.3 gpm (233,665.55 gpd)**

Peak hour demand factor:	3.5*ADD
Peak hour demand per dwelling unit:	0.945 gpm (1,360.8 gpd)
Peak hour demand - retail:	46.62 gpm (67,133 gpd)
Peak hour demand	**280 x 0.945 +46.62 = 311.22 gpm (448,067.73 gpd)**

Residential fire flow demand*:

*IFC 2018, Table B105.1

- Max. Building Area: **262,857 s.f.**
- For Construction **Type V-A**, min. required fire-flow is **6,750 gpm x 0.25** = 1,687.5 gpm or 2,500 gpm**

**Per Exception under IFC 2015, Sec. B105.2

TOTAL SITE DEMAND

Maximum day demand + Fire flow demand	**311.22 + 2,500 = 2,811gpm (2,811.22)**

APPENDIX A-7
Sanitary Sewer System Design Calculations

Manning's Formula

15" New Sewer Main Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.625
A = 1.227
S = 0.0022 ft/ft

Q = 3.029 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.625
S = 0.0022 ft/ft

V = 2.5 fps

15" New Sewer Main 0.65 d/D

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.625
A = 0.848
S = 0.0022 ft/ft

Q = 2.302 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.625
S = 0.0022 ft/ft

V = 2.72 fps

Manning's Formula

8" Pipe Flowing Full (sewer building connections)

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.33
A = 0.353
S = 0.0052 ft/ft

Q = 0.883 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.33
S = 0.0052 ft/ft

V = 2.5 fps

Manning's Formula

12" Existing Pipe Flowing Full (Scottsdale Road)

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.5
A = 0.785
S = 0.002 ft/ft

Q = 1.593 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.5
S = 0.002 ft/ft

V = 2.03 fps

12" Existing Pipe 0.65 d/D (Scottsdale Road)

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.5
A = 0.542
S = 0.002 ft/ft

Q = 1.21 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.5
S = 0.002 ft/ft

V = 2.23 fps

Manning's Formula

8" Existing Pipe Flowing Full (Continental Drive)

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.33
A = 0.353
S = 0.003 ft/ft

Q = 0.67 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.33
S = 0.003 ft/ft

V = 1.90 fps

Manning's Formula

8" Existing Pipe Flowing 0.65 d/D (Continental Drive)

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.125
A = 0.244
S = 0.0030 ft/ft

Q = 0.51 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.125
S = 0.0030 ft/ft

V = 2.09 fps

Sewer Demand Calculations

Average daily flow

Number of Units:	280
Average day demand per dwelling unit:	200
Average day demand:	**280 x 200 = 56,000 gpd**
Area of Retail:	**10,000**
Average day demand per s.f.:	**0.5**
Average day demand:	**5,000 gpd**
Total average daily flow:	**61,000 gpd = 0.0944 cfs**

Peak daily flow

56,000 gpd x 4.0 + 5,000 gpd x 3.0 = 239,000 gpd = 0.3698 cfs or 166 gpm

8" service line is connected to a proposed 15" sewer main that is connected to the existing 12” sewer main in Scottsdale Road. Another 8” service line is connected to the 8” sewer main in Continental Drive. Building sewer service lines to be sized by the plumbing engineer at the time of the final design.

Pool Backwash Flow Rate

100 gpm (0.22 cfs) assumed for preliminary purposes. Actual discharge and pipe sizing will be calculated at the time of final design. Current design plans for filter cartridge system that does not require pool backwash pipe installation. It is assumed that the two pool will not be backwashed at the same time.

Sewer Peak Daily Flow

166 gpm + 100 gpm (pool)	**266 gpm or 0.593 cfs**

Capacity of Existing 8" sewer line is **0.67** cfs > Peak Demand of **0.593 cfs**
Capacity of Proposed 15” Public Sewer = **3.029** cfs > Peak Demand of **0.593 cfs**
Capacity of Proposed 15” Public Sewer at Allowable d/D of 0.65 or 2.302 cfs (1,033 gpm) > 0.593 cfs (266 gpm)
It is anticipated that up to ¾ of the building will be serviced from the new 15” sewer main connected directly to the sewer main in Scottsdale Road.

PRELIMINARY WATER AND SEWER REPORT

South Scottsdale Mixed-Use Project

NWC of Scottsdale Rd & Continental Dr

1000 N Scottsdale Road

Scottsdale, AZ 85257

PRELIMINARY Basis of Design Report

- ☐ ACCEPTED
- ☑ ACCEPTED AS NOTED
- ☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE

SCOTTSDALE WATER

9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY ldillon **DATE** 7/27/2018

LDG PROJECT #1711151

Prepared for:
Mr. Lance D. Baker, AIA
Synectic Design Incorporated
1111 W. University Drive, Suite 104
Tempe, Arizona 85281

Submitted to:
City of Scottsdale
7447 E Indian School Road, Suite #125
Scottsdale, Arizona 85251

Address all comments noted in tracking sheet for Final Basis of Design submittal during DR. Items are called out or highlighted herein in yellow.

Stipulations:
1)Accurately determine fire flow and prove that ability to meet fire flow is met, if not infrastructure modifications will be required.
2) Proposed 15" sewer must extend to the existing manhole to west of property. Do not leave small section of 10" sewer.

Prepared by:
Land Development Group, LLC
8808 N Central Ave., Ste 288
Phoenix, Arizona 85020
Contact: Nick Prodanov, PE, PMP
P: 602 889 1984

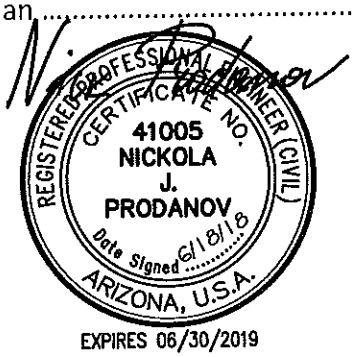
REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41005 NICKOLA J. PRODANOV Date Signed 6/18/18 ARIZONA, U.S.A.
EXPIRES 06/30/2019

June 18, 2018

14-ZN-2018
06/25/18

TABLE OF CONTENTS

APPENDICES



June 18, 2018

1. INTRODUCTION

This preliminary water and sewer report has been developed in accordance with the current Arizona, Maricopa County and City of Scottsdale ordinances, standards and policies for design and operation of domestic, fire and wastewater facilities. It provides preliminary engineering analysis and assessment of the existing water and sanitary sewer systems that currently service the subject development.

The project site consists of a fully developed parcels, with a total area of 4.429 acres, located at the northwest corner of Scottsdale Road and Continental Drive – 1000 N Scottsdale Road, Scottsdale, AZ 85257. The property is zoned C-3 and it is bounded by Continental Drive on the south, Scottsdale Road on the east, a commercial development on the north, and multifamily residential development on the west. The parcel is located within the Scottsdale Q.S. 12-44 and is being a portion of the SE ¼ of the NE ¼ of Section 3, Township 1 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to Appendix A-1 – Vicinity Map.

The proposed development includes a 267-unit apartment complex and 12,545 square feet of retail space. Existing car dealership buildings and asphalt pavement will be removed.

This preliminary report provides verification results for the water service demands for Average Day, Maximum Day, Peak Hour and Fire Flow rates for the entire development. No phasing is anticipated for this project. The results provided herein demonstrate that the existing water and sanitary sewer systems are capable of providing for the estimated demand and is in compliance with the City standards and performance. No wells or on-site water storage are proposed with this development. The procedures used herein are derived from, and performed with, currently accepted engineering methodologies and practices.

2. EXISTING CONDITIONS

Currently the site is fully developed with asphalt pavement parking, driveways, walls and two commercial buildings. The entire property will be demolished and cleared with the proposed project. The lot consists primarily of impervious surfaces with small DG landscape area along the frontage of Scottsdale Road. The overall existing terrain on site is relatively flat and slopes in southeasterly direction with less than 1%. The land in the vicinity generally slopes in southerly direction. The site has an average elevation of 1226 (NAVD88), a peak elevation of 1228 and the lowest elevation of 1224.

City of Scottsdale is the water and sanitary provider for this project. Based on the obtained by the City Water and Sewer Maps, 12" VCP public sewer main runs in Scottsdale Road, and 8" VCP sewer main in Continental Drive. There is also a 10" VCP main that runs in 8' sewer easement, west to east, in the north portion of the site. Most likely existing buildings are served off the latter 10" VCP sewer.

The project is located within Pressure Zone #1 with Ground Elevation Ranges of 1250 to 1330. There is an 8" ACP water main in Scottsdale Road, and two unknown size mains in the Continental Drive right of way. The water main that runs north of the sidewalk in Continental is a dead-end line that serves the multifamily development to the west of the subject project. Two test wells were noted on this line. Three water meters supply domestic and landscape irrigation water to the existing site. There is an 8" ACP line connected to the 8" main in Scottsdale Road that is used for fire sprinklers system. There are two fire hydrants in the street – NWC of Scottsdale Road and Continental Drive and another one near the northeast corner of the site.

3. DESIGN CRITERIA AND PROJECTED WATER DEMANDS

The following design parameters and requirements were derived from the City of Scottsdale Standards and Policies manual, Figure 6.1-2:
Average day demand per dwelling unit: **185.3**
Maximum daily peaking factor: **2.0**
Peak hour demand factor: **3.5**

Average Day Demand for retail: 0.6 gpd / s.f.

City of Scottsdale Fire Department follows 2015 International Fire Code.
Per the Appendix B, Section B105.2 of 2015 IFC, up to a 75% reduction of the fire flow can be granted if an approved automatic sprinkler system is installed. The resulting fire flow shall not be less than the required minimum of 1,500 gpm.

Proposed construction type is V-B with the following breakdown of the square footages per building use (two separate buildings are considered) and level:

- Retail – **12,545** s.f.
- Garage Level – **111,883** s.f.
- Residential – **210,205** s.f.

What is elevation?

MINIMUM REQUIRED FIREFLOW AND FLOW DURATION FOR BUILDINGS

BLDG DESIGNATION	CONSTRUCTION TYPE	GROSS AREA (s.f.)	FIRE FLOW (gpm)	FLOW DURATION (hrs)
Retail	V-B	12,545	3,000	3
Garage	I-A	111,283	3,500	3
Residential	V-B	210,205	8,000	4

The static pressure in the distribution system should not exceed 120 pounds per square inch (psi), and the system shall be designed to maintain a minimum residual pressure of 50 psi at the highest, finished, floor level to be served by system pressure under normal daily operating conditions. The system is designed to maintain 30 psi minimum pressure under the design fire flow requirements. The 30psi minimum pressure requirement provides a 10 psi safety factor to account for aging infrastructure and flexibility in locating pressure zone boundaries.

4. WATER PLAN

Two separate fire sprinkler taps are provided, which were connected to the mains in Scottsdale Road and Continental Drive. In addition, a new fire hydrant is proposed near the northwest property corner to provide for minimum fire hydrant coverage. FDCs will be installed on the north and south sides of the buildings. A fire lane will be provided on the north and west sides of the building.

demand split and sizing per 2018 DS&PM provide analysis

The project will be served by two water meters. In addition, one 1" water meter is proposed to serve the landscape needs. Sizes of the water meters will be verified by the plumbing engineer during the design process. All existing services and 8" fire line will be removed to the water mains in the streets. Per the COS Design Standards & Policies Manual, the recommended max. capacity of 2" water meter is 80 gpm.

3 different numbers provided, which is the correct one?

The demand used for the required fire flow is 4,000 gpm, which is a 50% reduction of the required 8,000 gpm due to the fact that the buildings will be fully sprinklered as per the 2015 IFC, Appendix B, Section B105.2. Water systems were analyzed for average day, maximum day, peak hour and maximum day with fire demand.

A fire flow test was conducted for the site on May 22nd, 2018 by Arizona Flow Testing. The flow test resulted in 2,757 gpm of available water at 20 psi and a residual pressure of 22 psi when 18 psi safety factor is considered.

Refer to Appendix A-5 for fire flow test results and Appendix A-4 for water calculations.

Does not meet 4,000....2,700 split between 2 hydrants, detail split

15" acceptable, verify inverts with surveying prior to submittal of DR BODs

5. SANITARY SEWER SYSTEM

Existing 10" public sewer line is in conflict with the proposed development and will have to be relocated to the north. In order to be able to connect the realigned sewer with the minimum allowed slope of 0.24%, the sewer line has been increased to 15", which will be subject to approval by the Water Resources Department. It is anticipated that the sewer service for the project will be tapped of the proposed 15" sanitary sewer main.

We have calculated that the peak discharge from this development will be 278 gpm. In our opinion and based on the performed calculations, the 8" sewer tap has an adequate capacity.
Refer to Sanitary Sewer System Design Calculations in Appendix A-5.

no service connection shown on utility plan, provide 15" calc results

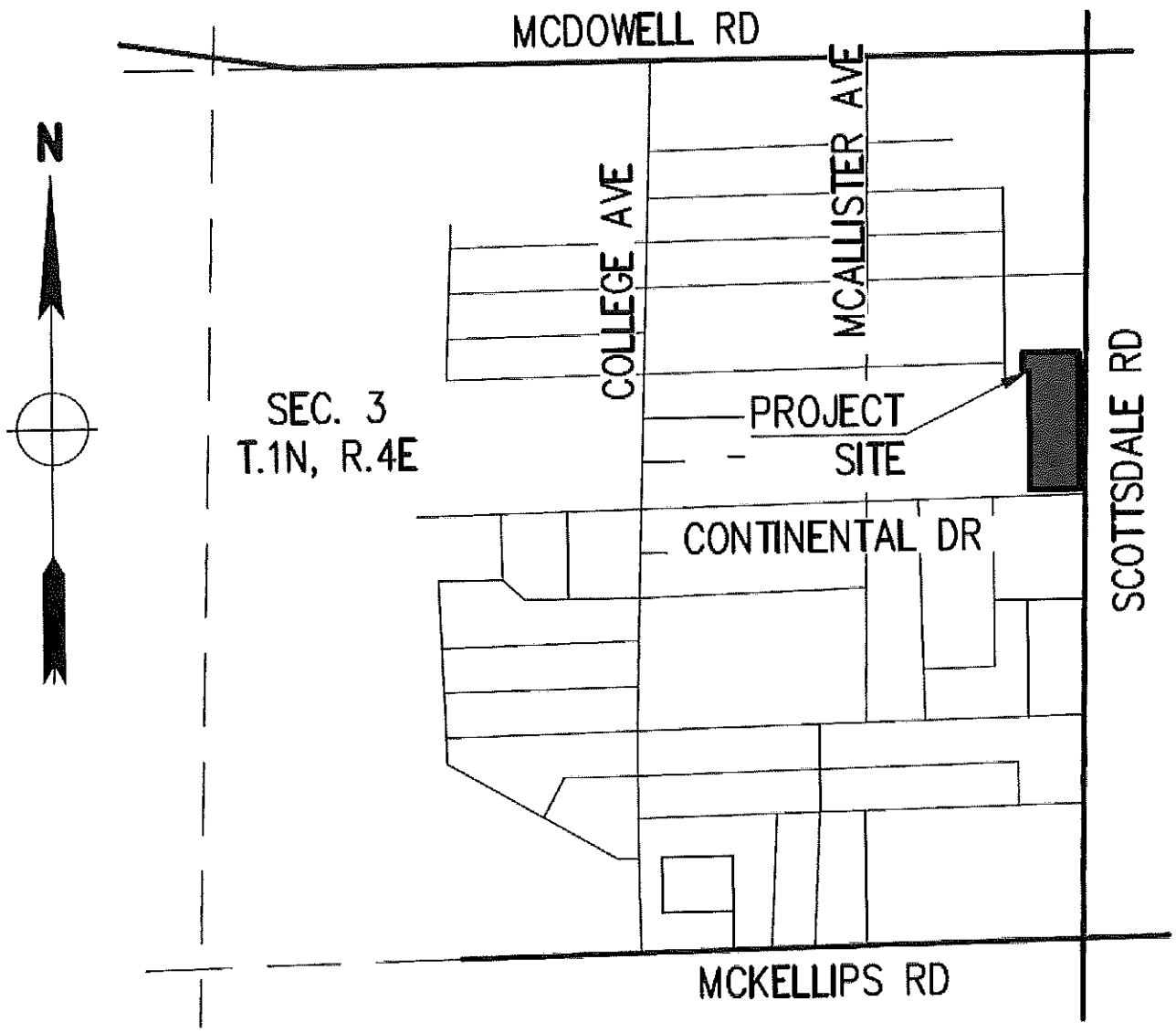
6. CONCLUSIONS AND RECOMMENDATIONS

The proposed improvements to the existing office development do not increase the demand to the existing water and sewer systems and it complies with the City design standards and policies and the Scottsdale Integrated Water Master Report. It is anticipated that the construction would start in second quarter of 2019 and will continue for 24 months.

7. REFERENCES

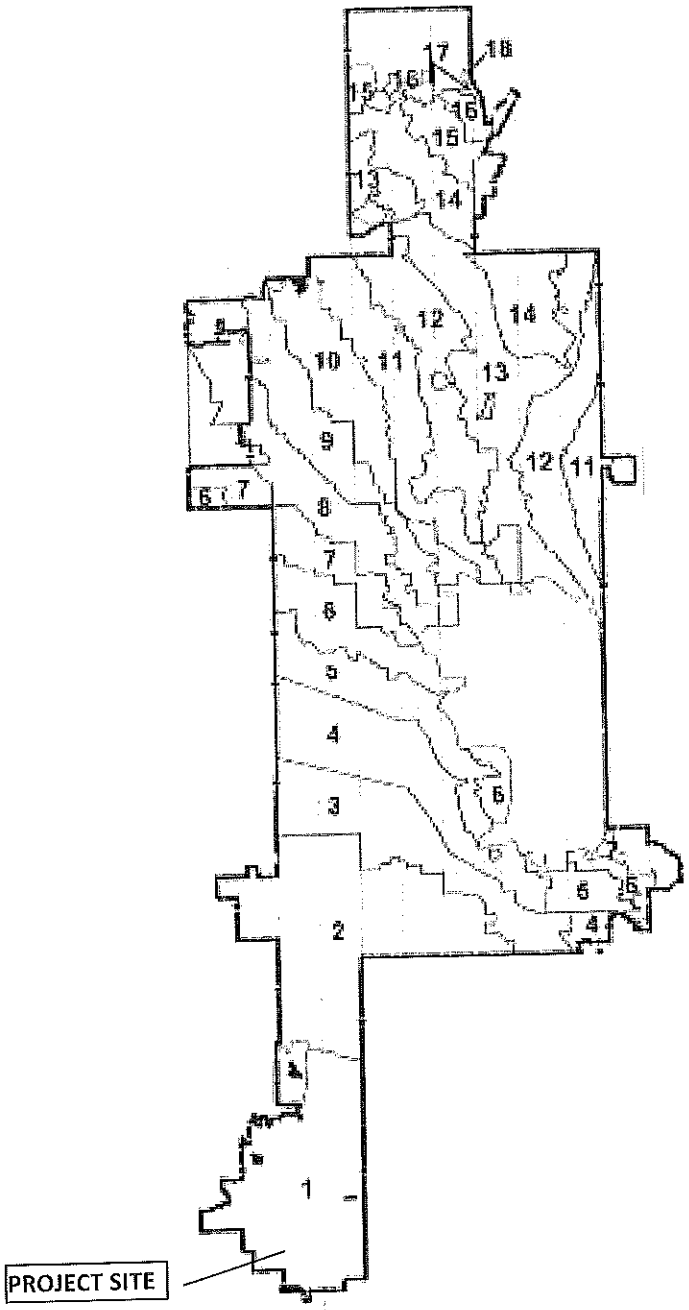
- City of Scottsdale Design Standards & Policies Manual
- City of Scottsdale Pressure Zone Map
- City of Scottsdale Quarter Section Maps
- ADEQ Engineering Bulletin No. 10, "Guidelines for the Construction of Water Systems"

APPENDIX A-1
Vicinity Map



APPENDIX A-2

Pressure Zone Map



Zone	Ground Elevation Range (Ft.)
1 1A 2A	1250-1330
2 3 4	1540-1650
4E 5 5E	1550-1650 1650-1790 1650-1790
6 6E 7	1790-1920 1750-1934 1920-2050
7E 8 8E	1934-2065 2050-2180 2065-2200
9 10 11,11E	2180-2310 2310-2440 2440-2570
12,12E 13 14 15	2570-2700 2700-2830 2830-2960 2960-3090

6.1-3 PRESSURE ZONE MAP

APPENDIX A-3
Public Water and Sewer Maps

APPENDIX A-4

Water Calculations

Determine design flow per 2018 DS&PM, use gpm values in table

Number of units:	267
Average day demand per dwelling unit:	185.3 gpd
Retail:	0.6 x 12,545 = 9,600 gpd
Average day demand:	**267x 185.3+7,527 = 57,002 gpd (39.58 gpm)**
Maximum daily peaking factor:	2.0*ADD
Maximum daily demand per dwelling unit:	370.6 gpd
Maximum daily demand - retail:	9,600 gpd
Maximum day demand	**267 x 370.6+9,600 = 108,550 gpd (75.38 gpm)**
Peak hour demand factor:	3.5*ADD
Peak hour demand per dwelling unit:	648.55 gpd
Peak hour demand - retail:	33,600 gpd
Peak hour demand	**267 x 648.55 +33,600 = 206,763 gpd (143.6 gpm)**

Residential fire flow demand*: **4,000 gpm**

*IFC 2012, Table B105.1

- Gross Building Area: **210,205 s.f.**
- For Construction **Type V-B**, min. required fire-flow is **8,000 gpm x 0.50** = 4,000 gpm**

**Per Exception under IFC 2012, Sec. B105.2

TOTAL SITE DEMAND

Peak hour demand + Fire flow demand **144 + 4,000 = 4,144 gpm**

You did not prove you could achieve this

APPENDIX A-5
Sanitary Sewer System Design Calculations

Manning's Formula

6" Pipe Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.125
A = 0.1963
S = 0.010 ft/ft

Q = 0.56 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.125
S = 0.010 ft/ft

V = 2.86 fps

Manning's Formula

8" Pipe Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.16667
A = 0.3490
S = 0.0050 ft/ft

Q = 0.86 cfs

Velocity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2}$$

n = 0.013
R = 0.16667
S = 0.0050 ft/ft

V = 2.45 fps

CALCS FOR 15" SEWER????

NOT CORRECT NUMBER

Sewer Demand Calculations

Average daily flow

Number of Units:	267
Average day demand per dwelling unit:	185.3
Average day demand:	**267 x 185.3 = 49,475 gpd**
Area of Retail:	**12,545 s.f.**
Average day demand per s.f.:	**0.6**
Average day demand:	**7,527 gpd**
Total average daily flow:	**57,002 gpd = 0.08819 cfs**

this needs to be known and shown for final BOD

Peak daily flow

0.08819 cfs x 4.5 = 0.3969 cfs or 178.1 gpm

Building sewer service lines to be verified by the plumbing engineer at the time of the final design.

Capacity of 8" sewer line is **0.86** cfs > Peak Demand of **0.397 cfs**

Pool Backwash Flow Rate

100 gpm (0.22 cfs) assumed for preliminary purposes. Actual discharge and pipe sizing will be calculated at the time of final design.

OK

Sewer Peak Daily Flow

178 gpm + 100 gpm (pool)

278 gpm or 0.62 cfs

Capacity of Proposed 8" Sewer at 0.50% = **0.86** cfs > Peak Demand of **0.62 cfs**

Capacity of Proposed 8" Sewer at Allowable d/D of 0.65 or 0.71 cfs (319 gpm) > 0.62 cfs (278 gpm)

CALCS FOR 15" SEWER????

Where is this discharging???

APPENDIX A-6
Fire Flow Test

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Not Provided
Project Address:	Scottsdale Road & Continental Drive, Scottsdale, Arizona 85257
Arizona Flow Testing Project No.:	18175
Client Project No.:	1711151
Flow Test Permit No.:	C55397
Date and time flow test conducted:	May 22, 2018 at 7:00 AM
Data is current and reliable until:	November 22, 2018
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Phil Cipolla – City of Scottsdale-Inspector (602-828-0847)

Raw Test Data

Static Pressure: **90.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **40.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **12.0 PSI Hyd A**
10.0 PSI Hyd B
(Measured in pounds per square inch)

Diffuser Orifice Diameter: 4 Inch
(Measured in inches)

Coefficient of Diffuser: 0.9 and .802

Flowing GPM: **2,700 GPM**
(Measured in gallons per minute)
1,489 GPM +1,211 GPM = 2,700 GPM

GPM @ 20 PSI: **3,237 GPM**

Data with 18 PSI Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **22.0 PSI**
(Measured in pounds per square inch)

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

Distance between hydrants: See Below

Main size: Not Provided

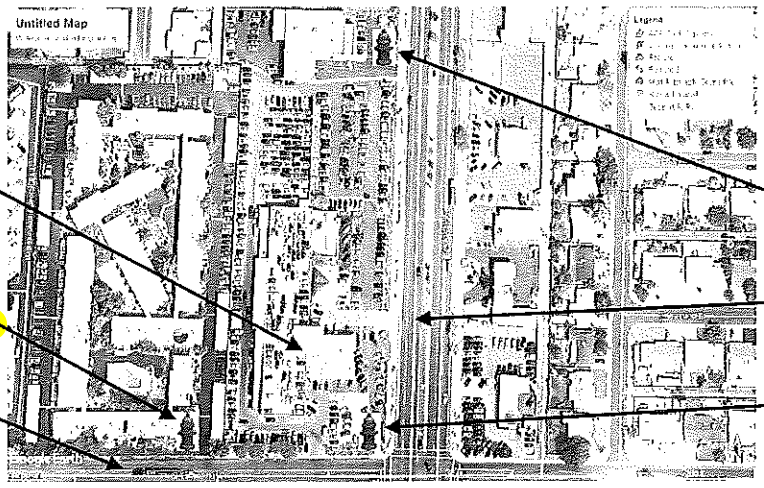
What is flow split between A and B?? Which is A?

Flowing GPM: **2,700 GPM**

GPM @ 20 PSI: **2,757 GPM**

Flow Test Location
+

North



Project Site
Scottsdale Road &
Continental Drive

Flow Fire Hydrant A

East Continental Drive

Flow Fire Hydrant B

North Scottsdale Road

Pressure Fire Hydrant

APPENDIX A-7
Preliminary Water and Sewer Plan

PRELIMINARY WATER & SEWER PLAN
SWC N SCOTTSDALE ROAD & CONTINENTAL DRIVE
1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

SUBDIVISION PLAT LOCATED WITHIN A PORTION OF THE E 1/2 OF THE SE 1/4 OF THE NE 1/4 OF SECTION 11, T.3N, R.4E OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- MONUMENT LINE
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- SEWER CLEANOUT
- LIGHT POLE
- SEWER MANHOLE
- STORM DRAIN INLET
- TRANSFORMER
- TELE COMMUNICATIONS PEDESTAL
- CATV, PHONE
- GAS LINE
- CATV, PHONE
- SEWER LINE
- WATER LINE
- ELECTRIC LINE
- FIRE LINE

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN IS SITUATED (IN) SCOTTSDALE, IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS:

LOT 1, A PROPERTY ASSEMBLAGE IN THE CITY OF SCOTTSDALE, ACCORDING TO BOOK 815 OF MAPS, PAGE 7, RECORDS OF MARICOPA COUNTY, ARIZONA LOCATED IN THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 3, TOWNSHIP 1 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA.

APN: 129-13-002G, 129-13-002K, 129-13-003D, 129-13-002J, 129-13-004D, 129-13-004E

FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY # 045012	PANEL # 2235 OF 4425	SUFFIX L	BASE FLOOD ELEVATION N/A
MAP # 0401.5C	PANEL DATE 10/16/2013	ZONE "X"	

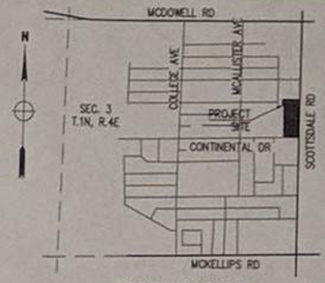
*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

BASIS OF BEARINGS

THE MONUMENT LINE OF SCOTTSDALE ROAD THE BEARING OF WHICH IS N00°00'00"W, AS SHOWN ON THE PLAT OF MARK MITSUBISHI, RECORDED IN BOOK 815, PAGE 7, MCR.

BENCHMARK

BRASS CAP IN HAND HOLE AT THE INTERSECTION OF SCOTTSDALE RD AND MCDOWELL ROAD HAVING AN ELEVATION OF 1230.69, CITY OF SCOTTSDALE DATUM, NAVD 88 DATUM, BM# 5032



VICINITY MAP
NTS

SITE DATA

APN: 129-13-002G, 129-13-003E, 129-13-003D, 129-13-004D
ADDRESS: 1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257
LOT AREA: 192,943 S.F (4.429 AC.)
Q.S.: 12-44

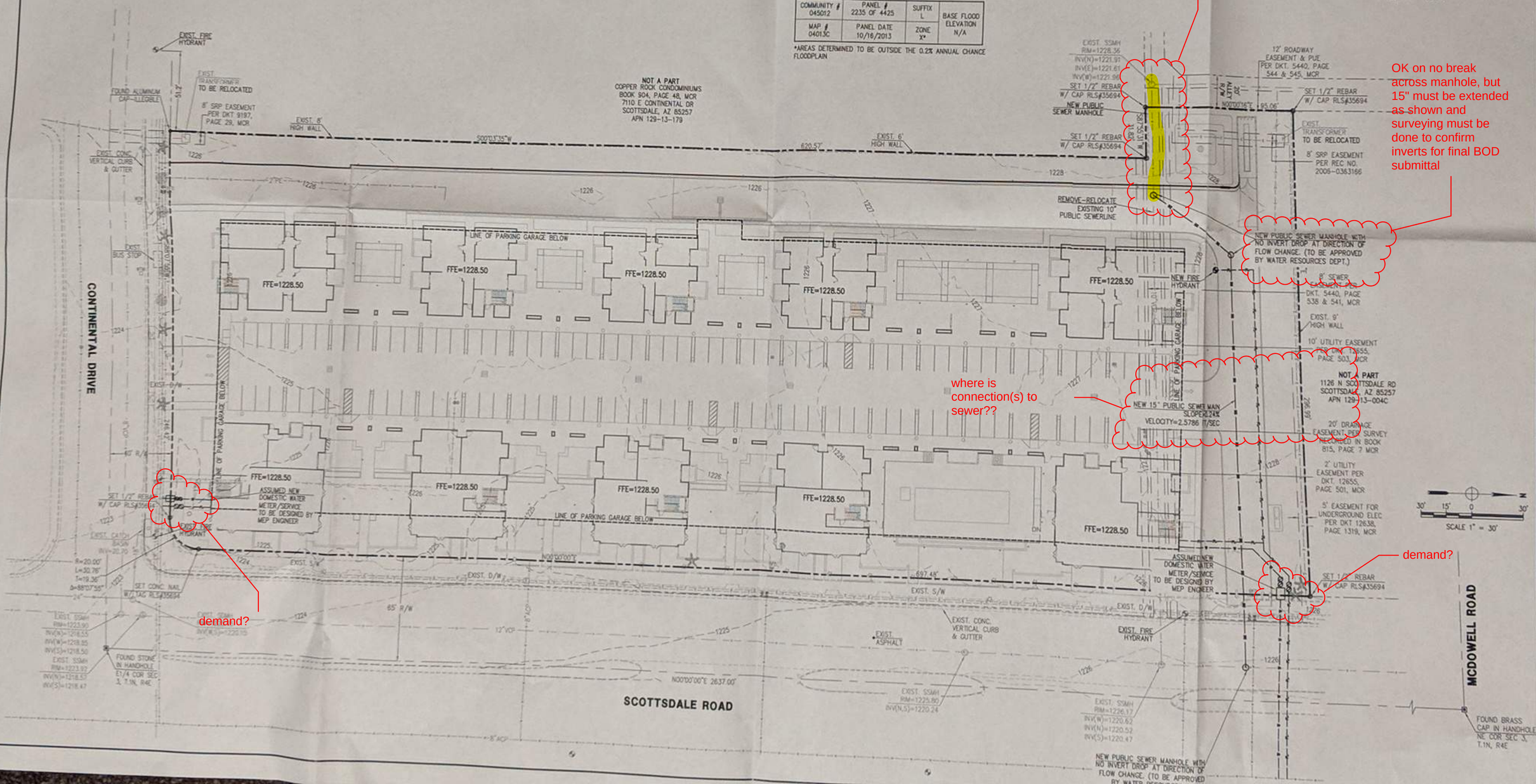
Extend 15" here

OK on no break across manhole, but 15" must be extended as shown and surveying must be done to confirm inverts for final BOD submittal

where is connection(s) to sewer??

demand?

demand?



DATE: 05/05/18
SCALE: 1"=30'
DESIGNED BY: MP
DRAWN BY: DW
CHECKED BY: JF
JOB: 1711151
VERSION: 1.1
PLOT DATE: 05/05/18
REVISIONS:

PRELIMINARY WATER & SEWER PLAN

1000 N SCOTTSDALE RD., SCOTTSDALE, AZ 85257

Land DEVELOPMENT GROUP
P 602 889 1984 | F 602 445 9462
6906 N CENTRAL AVE., SUITE 288
PHOENIX, AZ 85020
PHOENIXLDG@YAHOO.COM

PRELIMINARY NOT FOR CONSTRUCTION